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Effectiveness of Implementing Computer-Assisted Language Learning Technology in the English for Specific Purposes Training Program

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EFFECTIVENESS OF IMPLEMENTING COMPUTER-ASSISTED LANGUAGE LEARNING TECHNOLOGY IN THE ENGLISH FOR SPECIFIC PURPOSES TRAINING PROGRAM

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ABSTRACT

An increasing number of private and public organizations and educational institutions are incorporating Computer-Assisted Language Learning (CALL) technology into either their traditional classroom setting, or online English for Specific Purposes (ESP) training programs. In the role of facilitating students' learning, it is important for all stakeholders of ESP training programs to investigate the effectiveness of implementing online learning CALL systems into the distance learning environment and the traditional classroom environment of the programs. In order to determine the "effectiveness" of a corporate ESP training program, the approach for this study was to evaluate trainees' pretest and posttest scores related to the ESP training program.

The experimental group of this one group pretest and posttest design study was a group of 18 Chinese adult male trainees enrolled in a flight academy's Aviation English training program that implemented with online learning CALL technology blended with an instructor, in central Florida. The intervention of the study was the implementation of online learning CALL technology blended with an instructor in the classroom environment. The length of the intervention was eight weeks of Aviation English training that implemented blended learning instructions. In addition, a survey instrument was developed to collect data on students' basic information, attitudes toward learning English with CALL technology, motivations for study English, and their perceptions of CALL technology as facilitating interactions among students. The surveys were completed by the students before and after two months of intervention.

The study found that within two months of the implementation of the blended learning in the Aviation English training program, participants had significant

improvement on their test scores. Participants in the study generally had positive attitudes toward learning English with CALL, before and after two months of the Aviation English training program. They also had positive perceptions of CALL technology in facilitating interactions in the classroom, before and after the training program. The study also found that participants who had positive perceptions of CALL in facilitating interactions in the classroom tended to have positive attitudes toward using CALL in learning English.

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CHAPTER I

INTRODUCTION

The general purpose of this study was to examine the effectiveness of the implementation of online learning Computer-Assisted Language Learning (CALL) systems blended with an instructor (blended learning) in the English for Specific Purposes (ESP) training program. The effectiveness of ESP training programs affects trainees who need to apply what they have learned in the ESP training courses to their daily jobs. The administrators, policy makers, and the instructors of the ESP training programs need to examine the effectiveness of the implementation of the CALL in their training programs to determine policy changes. In addition, the system developers of CALL technology also need to evaluate the effectiveness of implementing CALL in ESP training programs to determine changes for improvements. To examine the effectiveness of the implementation of blended learning, this study compared and analyzed the pretest and posttest scores on the Aviation English Placement Exam (AEPE) of a group of Chinese adult flight students who were enrolled in a corporate blended learning Aviation English training program.

Background of the Study

The stakeholders of an ESP training program include institutions, companies, trainees, and the instructors. Training outcomes not only affect the overall productivity of an organization, but also the safety of the company's customers and the employees. The effectiveness of an ESP training program is crucial to all the stakeholders of companies or organizations that demand ESP training for their employees and to the stakeholders of the institutions that supply the ESP training programs to their customers. In working

environments, the training outcomes have the potential to be harmful when employees need to apply the necessary knowledge and skills that are vital to their job responsibilities. An innovative instruction method may be needed, such as implementing the online learning CALL technology blended with an instructor in the classroom (blended learning), when the traditional classroom or solely online instruction are ineffective.

Semel and Wiig (1981), Choi, Kim, and Boo (2003), Leahy (1998), Aacken (1999), and Oxford and Shearin's (1994) studies were the frames of reference for this research study. Semel and Wiig's (1981) study on whether a new training program would improve the language skills of the children with language-learning disabilities was the frame of reference of this research design. Semel and Wiig (1981) employed the "one-group pretest-posttest design" (Gall, Borg, & Gall, 1996, p. 491) to determine whether the new training program, Semel Auditory Processing Program (SAPP), could improve the language processing abilities among children with language-learning disabilities. Semel and Wiig (1981) utilized this research design to conduct their study in a school system in which the schools did not permit different instructional services for students. The threat to internal validity of the one-group pretest-posttest design, due to the absence of the control group was not serious, because Semel and Wiig (1981) were able to estimate the expected pretest-posttest score gain, under normal conditions (Gall et al., 1996).

"The one-group pretest-posttest design is appropriate when you are attempting to change a characteristic that is very stable or resistant to change" (Gall et al., 1996, p. 492), such as learning a second language. This study utilized the one-group pretest-

posttest design to conduct the research. The experimental group was a group of students who were enrolled in the English for Specific Purposes (ESP) training program with the implementation of the online learning Computer-Assisted Language Learning (CALL) technology blended with an instructor (blended learning). Akin to Semel and Wiig's (1981) study, this research study intended to evaluate the experimental group's pretest and posttest scores, under the instructional method of blended learning ESP training programs.

Choi, et al.'s (2003) study on the comparability of paper-based and computer-based language tests was the frame of reference of language testing for this study. Choi et al. (2003) compared the experimental and control groups' listening comprehension, reading comprehension, grammar, and vocabulary test scores, which are the essential components of language testing. Previous exposure to computers, attitudes toward computer technology, and educational background variables were examined in the study, in which some of the data were collected from previous related studies, while some were collected via surveys. The variables of "previous exposure to computers", "attitudes toward computer technology", and "educational background" that had been identified and the variables were operational in Choi et al.'s (2003) study were the framework of variables to be measured via surveys in this study.

Leahy's (1998) study on the CALL systems for student centered legal language study was another framework of this research study. Leahy (1998) identified theoretical considerations within the context of second language learning: students' exposure to the language, glosses, interactions, and motivations. Questionnaires were used in Leahy's (1998) study to collect students' perceptions of learning second language with the

implementation of Computer-Assisted Language Learning systems. This study adapted the variables of "motivations", "students' exposure to the language", "interactions", and "students' perceptions of learning English with CALL systems" that had been identified and the variables were operational in Leahy's (1998) study as the framework for the variables to be measured through surveys.

Aacken's (1999) study on second language learners' motivations in learning Kanji with CALL technology was utilized as a framework of second language learners' motivations for this study. Aacken (1999) attempted to correlate second language learners' motivations and their attitudes toward learning the second language with CALL technology. This study collected the data for variables of "learners' motivations" and their "attitudes toward learning English with online learning CALL technology" via surveying the experimental group, in order to examine whether correlations existed between these variables. Oxford and Shearin's (1994) work on learners' language learning motivations was another frame of reference for the variable of learners' motivations in this study.

Oxford and Shearin (1994) indicate that integrative and instrumental reasons are the frequent motivators for second language learners. Further, Gardner (as cited in Oxford & Shearin, 1994) has no longer treated the primacy of integrative motivations as essential or meaningful motivations for learners to second language learning. Hence, this study focused primarily on the instrumental motivations for second language learners in learning English for a Specific Purposes. The instrumental motivations theories imply that second language learners engage in instrumental activities to achieve valued outcomes (Oxford & Shearin, 1994).

Statement of the Problem

The trend in employee training has swung back from e-learning to classroom training programs (Salopek, 2002). "As learners become more exposed to and comfortable with e-learning, their expectations for any learning experience--including classroom sessions--are changing" (p. 74); furthermore, particular e-learning elements are being incorporated into the classrooms (Salopek, 2002). An increasing number of private and public organizations and educational institutions are incorporating CALL technology into either their traditional classroom setting, or online ESP training programs. In the role of facilitating students' learning, it is important for all stakeholders of ESP training programs to investigate the effectiveness of implementing online learning CALL systems into the distance learning environment and the traditional classroom environment of the programs. In order to determine the "effectiveness" of a corporate ESP training program, the approach for this study was to evaluate trainees' pretest and posttest scores related to the ESP training program.

For policy makers, the examination of the effectiveness of implementing online learning CALL technology in ESP training programs is also important to determine appropriate policy changes. The effectiveness of implementing blended learning in the ESP training programs has potential impact on organizations and educational institutions of the programs. The implementation of blended learning could have the potential of attracting more investors and students to the particular training program. Quan (2000) indicated that the online training market has grown from zero in 1996 to $1.2 billion in 1999 and the market was expected to reach $10 billion to $12 billion by 2003.

An effective ESP training program can not only improve employees' communication skills and productivity at both personal and organizational levels, but also it can be beneficial to societies and nations' economies in which the effectiveness of ESP training has the potential of enhancing international communication efficiently and effectively in the multinational corporation environment (Charles & Marschan-Piekkari, 2002). It is also beneficial to researchers and developers of CALL technology to investigate the effectiveness of implementing blended learning in the ESP training programs. The findings of the investigation could encourage further research and development for new CALL technology to be implemented into either ESP or other training programs to reach a balancing act between theory and practice (Cushion & Hémard, 2000). This study intends to address the problem of whether the implementation of the blended learning in the corporate ESP training program is effective.

Research Questions

Descriptive and inferential research questions were investigated:

Research Question 1: To what extent is there a significant difference between the pretest and the posttest scores of students who are enrolled in the English for Specific Purposes (ESP) training program implemented with the online learning Computer-Assisted Language Learning (CALL) technology blended with an instructor in the classroom (blended learning)?

Research Question 2: To what extent is there a significant difference between the pretest and the posttest scores of students who are enrolled in the blended learning ESP training program in the areas of listening, reading, vocabulary, and grammar components of the test?

Research Question 3: What are the attitudes of students who are enrolled in the blended learning ESP training program, toward learning ESP with CALL technology?

Research Question 4: To what extent do students perceive the CALL technology as facilitating interactions among students in learning ESP?

Research Question 5: Do students' educational levels, age, years of prior computer experience, years of experience studying English, their perceptions of CALL technology as facilitating interactions among students, or their motivations affect their attitudes toward learning ESP with CALL technology?

Research Question 6: Do students' educational levels, age, years of prior computer experience, years of experience studying English, years of aviation training experience, amount of time viewing TV and movies, amount of time of students' interactions with native English-speakers, amount of time they communicated in English among themselves, their motivations, their perceptions of CALL technology as facilitating interactions among students, or their attitudes toward learning ESP with CALL affect their score gains?

Data Collection and Data Analysis

This study was a quantitative study with pre-experimental one group pretest and posttest research design (Babbie, 2001, p.224). The data sources of this study were the pretest and posttest scores of students, who were enrolled in the classroom setting ESP training program with the implementation of "V" company's online learning CALL technology blended with an instructor. In addition, Gall et al. (1996) suggest that it is reasonable to expect students to make some language gains over time, via living in the target language community. That is, therefore, the "maturation" threat to the internal

validity of the design (Mitchell & Jolley, 1996, p.371). To minimize this threat to the internal validity of the one group pretest and posttest design, the length of the intervention was minimized to two months. Additionally, this research collected data on the students' amount of time of students' interactions with native English-speakers and their amount of time viewed TV and movies. The pretest and posttest scores were statistically analyzed and the score variations were evaluated.

The study population of this research was the adult students who were enrolled in the blended learning ESP training in the state of Florida. The sample for this study was the adult students who were enrolled in a flight academy's blended learning Aviation English training, in central Florida. The experimental group of this one group pretest and posttest design study was a group of 18 Chinese adult male trainees enrolled in the participating flight academy's Aviation English training program that implemented with "V" company's online learning CALL technology blended with an instructor, in central Florida. The intervention of the study was the implementation of online learning CALL technology blended with an instructor in the classroom environment. The length of the intervention was eight weeks of Aviation English training that implemented blended learning instructions.

The data collection of the study began with first, obtained the permissions from the institution and the instructor of the ESP training program implemented with online learning CALL technology blended with an instructor. Next, students' pretest and posttest scores were collected by employing the Aviation English Placement Exam (AEPE) that was the standard test instrument for the participating blended learning Aviation English training program (see Appendix A: Permission to Use the AEPE

Instrument). The instructor of the participating blended learning Aviation English training program administered the AEPE test.

In addition, a survey instrument was developed to collect basic information of ESP learners' age, gender, years of prior computer experience, years of prior experience studying English, years of aviation training experience, highest education levels, amount of time of their interactions with native English-speakers, amount of time they viewed TV and movies, amount of time they communicated in English among themselves. In addition, the survey also intended to collect the data on students' attitudes toward learning English with CALL technology, motivations for study English, and their perceptions of CALL technology as facilitating interactions among students. The surveys were completed by the students who were enrolled in the blended learning Aviation English training program before and after two months of intervention. The survey includes series of statements with 5-point Likert scale responses, checklist items, and open-ended question items for participants to give feedback. The researcher administered the surveys.

The SPSS software was employed to analyze the collected data. Descriptive statistical frequency analyses were performed to demonstrate trainees' responses to each item of the survey. Paired-samples *t* tests (George & Mallery, 2001, p. 122) were performed to examine if there was a significant difference between the experimental group's pretest and posttest scores. One-way analysis of variance (ANOVA) (George & Mallery, 2001, p. 132) tests were performed to analyze if significant difference existed in the continuous variables between different groups. Bivariate correlation analyses were performed to test if correlation existed, the strength of the relationship, and the direction

of the relationship among the all the continuous variables. The above proposed statistical significance tests were at the .05 level of significance ($p < .05$), that is, the probability that the relationships occurred by chance is less than 5% (George & Mallery, 2001, p.114). Descriptive statistical frequency analyses were performed to demonstrate trainees' responses to the each item of the survey instrument. Frequency tests were performed on all the variables to demonstrate the frequency counts, mean, maximum, minimum, and the distributions to see if these variables were normally distributed.

Expected Results

Computer-Assisted Language Learning (CALL) provides tools and rich environments for foreign language learners with the databases of references of materials that encourage creative interactions (Armington, Bland, Gay, & Noblitt, 1990). Hall (1998) indicates implementing CALL and IT in a language learning class can bring advantages to the language teaching and learning. In addition, computers can not only improve communication, but also help language educators to promote changes (Mydlarski, 1998). The results of students' posttest scores of the experimental group, which implemented the blended learning instructions in the Aviation English training program, were expected to be higher than the pretest scores.

Hémard's (1998) study indicates that most students now are reasonably familiar with the Windows-based computer interface; increasingly, students resort to the locally networked facilities, Internet surfing, and e-mail communication (p.255). Du (1999) indicated that Internet development in China has been phenomenal. By the end of 1994, there were 1,600 Internet users in China; at the end of 1995, there were 6,400 users (Du, 1999). Moreover, the growth rate of total Internet users in China during 1996 to 1998

averaged 300%, three times that of the rest of the world (Du, 1999). There were 4 million Internet surfers by June 30, 1999 (Du, 1999). As of July 2001, there were 26.5 million Internet users, and the number of personal computers linked to the Internet stood at 10 million by June 30, 2001 (Freedomforum, 2001a).

In addition, nearly 80% of the Internet users in China have their own e-mail addresses, according to the *People's Daily* (Freedonforum, 2001b). Furthermore, Du's (1999) study indicated that there were significant positive correlations ($p < .01$) between the history of Chinese Internet users using the Internet and users' ages, income, PC skills, and English level. Total sales volume of personal computers in China reached 3.5 million in 1997, and was expected to top 30 percent by the end of 1997 (Du, 1999). Hence, with growing numbers of Internet users and total sales volume of personal computers in China, the years of students' prior computer experience were expected to be high for this study.

Furthermore, Aacken's (1999) study on second language learners' motivations and their attitudes toward CALL systems in acquisition of Kanji shows that learners generally have positive attitudes toward CALL technology in learning second languages. Students believe that in the long run, CALL technology is capable of assisting their individual learning (Aacken, 1999, p.132). Students have also shown their interests in the new and media-hyped technology, which have been seen to be beneficial and worthwhile to students' personal investment (Hémard, 1998). Hence, this study expected the experimental group to have generally positive attitudes toward learning English with CALL technology.

"It becomes clear that the computer does foster talk between learners" (Mydlarski, 1998, p. 130). Mydlarski (1998) argues that like peer learning in the classroom

environments, the cooperative model of CALL can result in a high degree of interaction. Language learners can participate in many cooperative CALL endeavors, such as, organizing students to talk around a computer, collaborative writing, and computer-mediated communication (Mydlarski, 1998). Mydlarski (1998) further discussed the advantages of applying the Cooperative Computer-Assisted Language Learning (CCALL) to language learners. "Within the group work, students can suggest, clarify, disagree, initiate, judge, manage, and teach" (Mydlarski, 1998, p. 127). In addition, explaining something to someone else often leads to cognitive restructuring, that is, while we talk, our minds change (Mydlarski, 1998).

Students tend to re-examine their own understanding and seek resolutions when the conceptual conflicts occur (Mydlarski, 1998). These conceptual conflicts have potential for highly productive learning in a second language learning setting (Mydlarski, 1998). Sanders and Kenner's study indicated that verbalizing some of the interactions among ESL learners helps learners to find out from their friends how to use computer and what was available on it, in which students perceived as beneficial in ESL learning (as cited in Mydlarski, 1998). Therefore, this study expected the experimental group to have positive attitudes toward CALL technology in facilitating interactions between language learners.

Significance of the Study

This study intended to examine the effectiveness of implementing online learning CALL technology blended with an instructor in the classroom setting (blended learning) ESP training program. The significance of this study is to substantively refine the existing knowledge in the literature of CALL systems in ESP training. Findings of this study are

also important to the stakeholders of ESP training programs; the stakeholders include: policy makers, corporations, educational institutions, institutional administrators, educational scholars and practitioners, and ESP learners. Furthermore, the results of this study have the potential of providing important data to the stakeholders to determine whether policy changes or the implementation of online learning CALL technology are needed for ESP training programs.

This study has the potential importance of extending the researcher's existing knowledge in the area of implementing blended learning in ESP training programs. In addition, this study also has the potential of providing critical data to the researcher's organization to determine the need of implementing the blended learning in its human resource development training programs. This study intended to provide indications of the effectiveness of implementing blended learning in ESP training programs for policy makers and institutional administrators, to determine the value of investing in blended learning in the ESP training courses.

According to Long (1999), it is estimated that organizations in the United States spent more than $60 billion annually on formal training programs. In spite of significant spending in the training programs, the skills that are learned by the trainees may have never actually been applied in the workplace (Donovan, Hannigan, & Crowe, 2001). Business leaders increasingly demand the accountability for training programs' outlays and benefits to the organizations (Long, 1999). In addition, Charles and Marschan-Piekkari (2002) suggested that language skills are essential within the multinational corporations in which foreign language and communication trainings should be

encouraged. This study intended to investigate the effectiveness of implementing blended learning in the corporate ESP training program.

Chen and Zhao (1997) indicate that educational professionals are in constant search of ways to enhance students' classroom learning experiences in which foreign language professionals have been in the forefront of adopting technology. Computer-Assisted Language Learning (CALL) technology has been an integral part of foreign language classrooms (Chen & Zhao, 1997). Computer technology also plays a key role in "promoting cooperation between language professionals by helping them to communicate with one another and, in the process, breaking down some of the barriers that exist between them" (Mydlarski, 1998, p.134). Furthermore, computer technology not only improves communication, but also it helps language educators to promote changes (Mydlarski, 1998).

CALL has affected the practice of language teaching (Davies & Williamson, 1998). Dunkel (1987) indicates that due to the promises of cost-efficient and versatile computer technology, computer-literate future students and teachers should help incorporate the CALL and CAI (Computer-Assisted Instruction) technologies into the core of academic curriculum (p.251). Peterson (1999) further argues that CALL systems are the most commonly multipurpose in nature, and the systems facilitate both in-class and individual studies. Put into effect, CALL technology presents learners with the access to networked computers, e-mail, word processors, and language learning software (Peterson, 1999).

In addition, CALL provides tools and rich environments for foreign language learners with the databases of references of materials that encourage creative interactions

by students (Armington, et al., 1990). Verbalizing the interaction, such as, explaining something to someone else often leads to cognitive restructuring, that is, while we talk, our minds change (Mydlarski, 1998). Students tend to re-examine their own understanding and seek resolutions when the conceptual conflicts occur (Mydlarski, 1998). These conceptual conflicts have potential for highly productive learning in a second language learning setting (Mydlarski, 1998). One of the goals of this study was to examine learners' perceptions on the CALL technology's role in facilitating interactions among students.

Pugh (1997) suggests that more research is needed to study the outcomes of language teaching methodologies and CALL in comparison with other language teaching methods. Pugh (1997) further argues that making innovation meaningful and effective in language teaching means more than simply putting learners before the ready-made CALL programs that are not designed specifically for the particular trainees. That is, according to Pugh (1997), neither traditional CALL nor sophisticated hypertext programs can guarantee improvements in the outcomes of different language learners. Unless students' academic performance or second language acquisition improved, the perception of effectiveness could be that the millions of dollars invested in CAI or CALL have been lost (Dunkel, 1987).

Therefore, it is essential to have disciplined and valid research efforts in the study of effectiveness of CAI and CALL (Dunkel, 1987). This study intended to provide refinements of existing knowledge in the literature of implementing the blended learning in ESP training programs that could further provide important data to scholars and practitioners in the fields of English for Specific Purposes (ESP) and Human Resource

Development (HRD) to assess the merits of implementing the blended learning in ESP training programs.

Scope of the Study

The limitations of this study were the absence of a control group and the results of this study cannot be generalized to all adult ESOL learners as only a group of Chinese adult students who were enrolled in a corporate blended learning ESP training program was employed in this study. In the corporate setting, different methods of instructional services to students would not be permissible. That is, all the participating students were learning the English for Specific Purposes in the classroom-setting environment implemented with online learning Computer-Assisted Language Learning systems blended with an instructor. In addition, the institution that agreed to participate in this study did not provide online learning training programs. Hence, the ideal control group of students who were enrolled in the online learning ESP training programs that were provided by the same institution and taught by the same instructor during the same period of intervention as the experimental group was not available to the researcher.

In order to examine the effectiveness of implementing the blended learning in ESP training program, it was preferable to study the entire target population that implements the blended learning in the ESP training programs. However, due to the limited financial and human resources, this study selected samples within the target population. The sample of this research study was a group of Chinese adult male trainees enrolled in a flight academy's ESP class that offers Aviation English training courses implemented with blended learning in central Florida.

Another limitation of this research study was the limited resource of human capital. To examine the effectiveness of implementing the blended learning in ESP training program, it was preferable to have researchers who have expertise in the area of Computer-Assisted Language Learning software development. This study focused on examining the outcomes of the implementation of blended learning instead of the design and the development process of specific CALL systems.

Contents

The contents of the remainder of the study include the literature reviews in the areas of Human Resource Development (HRD), English for Specific Purposes (ESP), and Computer-Assisted Language Learning (CALL). A chapter of quantitative research with pre-experimental one group pretest and posttest research design is included. A chapter of findings of the study and a discussion chapter are included in the remainder of this study.

CHAPTER II

REVIEW OF LITERATURE

The goal of the current study was to examine the effectiveness of the implementation of online learning Computer-Assisted Language Learning (CALL) systems blended with an instructor (blended learning) in the English for Specific Purposes (ESP) training program. To examine the effectiveness of the implementation of blended learning, this study compared and analyzed the pretest and posttest scores on the Aviation English Placement Exam of a group of Chinese adult flight students who were enrolled in a corporate blended learning Aviation English training program. In addition to the AEPE, a survey was developed to collect data before and after two months of intervention.

Chapter 2 begins with an overview of workplace literacy programs and the evaluation of training programs in the field of human resource development. Next, the assessment of English for Specific Purposes in practice is discussed. In addition, the discussions of aspects of Computer-Assisted Language Learning (CALL) systems and the roles of CALL in assisting language learning are included in this chapter.

Human Resource Development

Workplace Literacy Programs and the Evaluation of Training Programs

It is estimated that organizations in the United States spend more than $60 billion annually on formal training programs (Long, 1999). Moreover, business leaders increasingly demand accountability for the training programs' outlays and the benefits to the organizations (Long, 1999). Furthermore, "according to a 2001 report, $56.8 billion was budgeted nationwide for formal training within organizations" (Sherrick, 2002, p.

51). "In 1977, the Conference Board reported that 11% of all companies offered remedial education (70% reported offering some kind of formal training)" (Boyle, 1999, p.258). In 1987, the federal government began a workplace literacy plan in order to provide financial support, to demonstrate effective models, and to require cooperation among stakeholders (Boyle, 1999). In 1978, the Adult Education Act was amended, providing for discretionary programs to support ESL that began in 1981. In addition, the Literacy Grant Program was established in 1993, designed for individuals who have special literacy needs with learning disabilities and individuals with limited English proficiency (Boyle, 1999).

According to Baynton (2001), literacy problems are costing U.S. companies $60 billion annually in lost productivity. Boyle (1999) stated, "The U.S. Department of Labor places illiteracy's costs to businesses at about $225 billion per annum. The costs result from employee mistakes, injuries, absenteeism, tardiness, missed opportunities, and other problems" (p.229). In spite of significant spending in the training programs, the skills that are learned in the training may never actually be applied in the workplace (Donovan, et al., 2001). The effectiveness of transfer of training is a critical factor in determining the utility of training programs in organizations (Elangovan & Karakowsky, 1999).

Donovan, et al. (2001) argues that the economic approaches to evaluate the effectiveness of training have proven inadequate, particularly where the economic models tend to focus on the productivity and the Return On Investment (ROI). There are limitations with current economic studies when taking the applicability to the Human Resource Development (HRD) field into the consideration (Wang, Dou, & Li, 2002). The economic studies of ROI rarely offer either pre-program recommendations or post-

program feedback for HRD intervention that has been the highlight of HRD programs' ROI measurement (Wang, et al., 2002). In addition, Wang, et al. (2002) further argue that economists often lack in-depth knowledge and expertise in the areas of HRD and performance improvement.

The ROI data alone cannot address other crucial business impacts, nor can the ROI data alone help HRD specialists and practitioners to improve training (Long, 1999). Furthermore, supplementary information is needed, such as the evaluation data of behavior, learning, and reactions to increase the impact of particular training and development programs (Long, 1999). This study intended to evaluate the effectiveness of an ESP training program implemented with blended learning via the evaluation of learners' pretest and posttest scores on AEPE, their motivations, and their attitudes toward learning the ESP with the online learning CALL technology.

English for Specific Purposes

In the global business environment, multicultural communication and multinational business may overlap (Nakasako, 1998). As more business is conducted internationally and with a more multicultural workforce, international and multicultural issues have been of increasing interest to technical and business publications (Thrush, 2001). For instance, as China becomes more open to other countries, the enthusiasm for English language learning in China is growing (Boyle, 2000). In Malaysia and Singapore, traditional teaching of business communication has been tied to the English for Specific Purposes (ESP) and Business English (BE) (Tan, 1998). Thrush (2001) uses the example of a China Airlines flight's crash in 1989 to illustrate the importance of technical and plain English training. Language skill is essential within multinational corporations, and

foreign language and communication training should be encouraged (Charles & Marschan-Piekkari, 2002). Charles and Marschan-Piekkari (2002) use their study of a British company operating in China to illustrate the importance of finding a common language (English) between Chinese and Taiwanese staffs to improve communication within multinational corporations.

Over the last several decades, research related to communication in Japan has shifted toward issues involving global competitiveness, human and technical communication networks, and communication improvement across cultures (Nakasako, 1998). Nakasako (1998) further suggests future research should focus on various aspects of the Internet, which appears to be changing many Japanese companies' traditional communication style. Even though foreign languages and international communication play important roles in the current globalized business environment, there are few studies focusing primarily on the foreign language skills and the communication enhancement roles in the multinational corporations' environment (Charles & Marschan-Piekkari, 2002). Most English as a Second Language/English for Specific Purposes (ESP) literature focuses on the non-technical texts with students living in the English-speaking environment; therefore, more information is needed on how specific ESP programs facilitate or interfere with learning English for the learners from different culture and language backgrounds (Thrush, 2001).

Assessing the ESP Training Programs

In Hayes and Cargile's (1998) study, trainees' test scores on improvement on the Test of English for International Communication (TOEIC) failed to help companies to predict the success of participants in the training program. Students were sent by those

companies to study in the Intensive International Executive Program (IIEP), which is an English-based, cross-cultural, and business-training program (Hayes & Cargile, 1998). Based on the program-specific average TOEIC increases, it failed to help the IIEP to predict individual or training program gains (Hayes & Cargile, 1998). Yoshida (1998) also indicated that ESP educators often overlook the importance of consulting with the learners who will or have benefited from the ESP programs. Hence, this study evaluated not only the second language learners' pretest and posttest score gains, but also their motivations of learning ESP and their attitudes toward learning English with the CALL technology to have comprehensive data via examining the effectiveness of implementing the blended learning in ESP training program.

Computer-Assisted Language Learning

Manning's study (as cited in Hall, 1998) indicates that there is no single ideal method for all types of learners and instruction structures. The trend of employee training has swung back to classroom training programs from e-learning (Salopek, 2002). "As learners become more exposed to and comfortable with e-learning, their expectations for any learning experience-including classroom sessions are changing" (p.74), and particular e-learning elements are being incorporated into the classroom (Salopek, 2002). Chen and Zhao (1997) indicate that educational professionals are in constant search of ways to enhance students' classroom learning experiences, as well as the foreign language professionals who have been in the forefront of adopting technology. Specifically, Computer-Assisted Language Learning (CALL) systems have been an integral part of the foreign language classroom (Chen & Zhao, 1997).

Moreover, CALL can help language learners to develop language fluency in a matter of hours, rather than weeks, months, and years (Davies & Williamson, 1998). "CALL classes often represent new ways of language learning in highly institutionalized and examination-based education systems" (Holmes, 1998, p.397). Davies and Williamson (1998) indicated that CALL has affected the practice of language teaching. "One of the holy grails of computer assisted language learning is to provide a sophisticated immersion environment in which learners can enhance their fluency in second language by actually using it to carry out authentic tasks" (Price, McCalla, & Bunt, 1999, p.84).

At the beginning of Computer-Assisted Instruction (CAI) in language learning, computers were used to deliver programmed instructions, which are text-based software on stand-alone machines (Harrison, 1998). In the mid 1980s, increasingly affordable multimedia hardware and software provided learning materials using sounds, images, and high quality animation; soon after, the Internet has brought multimedia to the networked environments that provide new learning tools (Harrison, 1998). Computer-Assisted Language Learning (CALL) provides tools and rich environments for foreign language learners with the databases of references of materials that encourage creative interactions (Armington, et al., 1990). Computer technology also plays a key role in "promoting cooperation between language professionals by helping them to communicate with one another and, in the process, breaking down some of the barriers that exist between them" (Mydlarski, 1998, p.134). In addition, computers can not only improve communication, but also help language educators to promote changes (Mydlarski, 1998).

Hall (1998) defines the term CALL as "referring to applications written specifically for language learning purpose" (p. 42). Peterson (1999) indicates that CALL systems are the most commonly multipurpose in nature, and the systems facilitate both in-class and individual studies. Within an institution, CALL technology provides learners with access to networked computers, e-mail, word processors, and language learning software (Peterson, 1999). Mydlarski (1998) further suggests that computers are superb storage and data retrieval devices, and computers are powerful research tools (p.133). Moreover, the element of real time recording of student responses of the CALL technology also encourages the direct instructors' involvements in the learning process (Armington, et al., 1990).

The promises of cost-efficient and versatile computer technology, computer-literate future students and teachers should help by incorporating the CALL and CAI (Computer-Assisted Instruction) technologies into the core of academic curriculum (Dunkel, 1987, p.251). Pugh (1997) further suggests that CALL should be put into economical, political, and pedagogical contexts. In the context of technology, CALL tends to be driven by the technology; in the economical context, CALL is justified in unproved economic criteria; in the political context, CALL is a political strategy to produce more graduates for equal or less amount of money; and in the pedagogical context, pedagogies have yet to prove CALL's worth (Pugh, 1997).

Bueno, Huffstutler, and Nelson (1999) indicate that as learners have more opportunities to test these educational technologies, more attention is given to student interactions to identify problems and evaluate the effectiveness of the computer systems' designs. Hall (1998) argues that computers should not be used for all aspects of language

teaching; unless, the use of computers fulfills the conditions of: offering genuine improvement over the conventional means of teaching, enriching students' learning experience, integrating into other programs, and being practicable. Davies and Williamson (1998) further suggest that the CALL program design is not only about providing rich environment for learners, but it is also about helping students to learn (p.10). Davies and Williamson (1998) argue that CALL not only has the tutoring systems, but also the possibility of simultaneously integrating different training levels.

The latest CALL packages incorporate multimedia (Hall, 1998). According to Nerbonne, Dokter, and Smit (1998), language technology includes speech recognition, lemmatization, parsing, text generation, speech synthesis, or part-of-speech (POS) disambiguation (p.544). Pugh (1997) points out that CALL's spell-checkers and text-parsers functions play valuable roles in saving teachers' time in the time-consuming tasks of correcting students' grammatical errors. The Electronic Visual Feedback (EVF) function of CALL system improves second language learners' pronunciation of both segmental and supra segmental (Lambacher, 1999). The EVF software has a spectrographic display, which allows learners to analyze their speech (Lambacher, 1999). Furthermore, Chen and Zhao (1997) indicate that the eWeb has been found useful among foreign language teachers, in which foreign characters can be displayed on the eWeb across platforms. IT can also be used in language teaching to elevate awareness of figural dimension of language and to promote in depth language learning (Pugh, 1997). Accessing CALL learning material can be more easily recognized and appreciated by adopting Web-based hypertext links (Cushion & Hémard, 2000).

Hall (1998) identifies the advantages of implementing CALL and IT in language teaching and learning. First, the computer adds variety to the language learning experience; second, the computer individualizes learning; third, in CALL exercises, the computer is capable of giving immediate feedback for each answer; fourth, working with a computer has the interactive element that is missing in books, tapes, and television; fifth, the computer saves teachers time and work; sixth, many students are already familiar with computers; and finally, students are motivated to use computers for other types of activities.

Pugh (1997) suggests more research is needed to study the outcomes of language teaching methodologies and CALL in comparison with other language teaching methods. Moreover, to make innovation meaningful and effective in language teachings means more than simply putting learners before ready-made CALL programs that are not designed specifically for particular trainees (Pugh, 1997). That is, according to Pugh (1997), neither traditional CALL nor sophisticated hypertext programs can guarantee improvements in the language learning outcomes of different language learners. Unless students' academic performance or second language acquisition improved, the perception of effectiveness could be that the millions of dollars invested in CAI or CALL have been lost (Dunkel, 1987). Therefore, it is essential to have disciplined and valid research efforts into the effectiveness of CAI and CALL (Dunkel, 1987).

Obstacles to Computer-Assisted Language Learning

Chen and Zhao (1997) argue that good computer-assisted language learning programs and systems have been the results of exceptional collaboration among theoretical, technical, and content experts. In addition, none of those good computer-

assisted language learning systems has been widely adopted in the classroom (Chen & Zhao, 1997). Smith, Courtney, and Rickers (1997) indicate that with the worst CALL activities, some students may perceive CALL systems as promoting passive attitudes toward learning; in addition, students may not be able to draw any long-term benefit from gap-filling exercises, text reconstructions, and grammar primer exercises (p.213).

Chen and Zhao (1997) point out that the platform incompatibility issue has handicapped many good CALL applications and reduced its potential of reaching more users. Moreover, the institutional CALL authoring development has been under funded and slow (Cushion & Hémard, 2000). Furthermore, Davies and Williamson (1998) indicate that many professional educators feared that computerized instruction could either wholly or partially replace them. However, Davies and Williamson (1998) argue that the reality is that the learners have been treated as if they were computers (p.9).

Students had identified negative assessments of poor integrations and inadequate use of CALL in language teaching (Cushion & Hémard, 2000). Nerbonne et al. (1998) further argue that not only the CALL systems should be linguistically reliable, technically stable, and predictable, but also students need to trust their CALL systems to be right about the provided information (p.546). In Nerbonne et al.'s (1998) study on comparing the GLOSSER function of a CALL system to the traditional method of text reading through using the hand-held dictionary, obstacles of CALL systems were identified. These included exaggerated claims (and subsequent disappointments), insufficient infrastructure, the need for staff training, incompatibility with other materials, and the competition with staff who feel threatened by CALL (Nerbonne et al, 1998, p.558).

"It has been seen that language learning strategies are an important consideration in second language acquisition" (Bull, 1997, p.10). Bull (1997) indicates that better results can be achieved in foreign language learning by students who use appropriate learning strategies, and that the students who use a greater variety of strategies can be more successful. However, Bull (1997) indicates that certain learning strategies will not necessarily be the best for all students. Therefore, it is necessary to raise learner self-awareness of different approaches to learning (Bull, 1997).

Moreover, an important part of learning foreign languages involves the use of learning strategies (Bull, 1997). In the aspect of promoting comprehension, language training also needs to facilitate language learners to use a variety of communicative strategies and expressions (Charles & Marschan-Piekkari, 2002). Bull (1997) argues that many CALL systems did not take research on how students learn languages into consideration. In addition, the tutorial and evaluative roles of computers were artificial and unreliable (Cushion & Hémard, 2000). Moreover, Cushion and Hémard's (2000) study indicated that CALL facilitated students' interaction, but that it was not meaningful and goal-oriented. Bull (1997) points out that CALL programs are limited in their ability to adapt to individuals and the CALL tends not to facilitate appropriate learning strategies. Cushion and Hémard's (2000) study on Human Computer Interaction (HCI) and CALL shows that students need more appropriately stated learning objectives; that is, CALL should be identified as a complementary resource.

Skeptics of CAI and CALL pointed out the predominance of non-significant differences in findings comparing CAI and traditional methods of instruction (Dunkel, 1987). Dunkel (1987) indicated that it was too early to attempt to judge the effectiveness

of CAI in second language tutors in the late 1980s. However, future research must consider investigating the effectiveness of CAI and CALL (Dunkel, 1987). Dunkel (1987) further suggested that future researchers must not only focus on the "medium" (computer), but also the variables of "message" (CAI/CALL lesson) and "recipient" of the message (learner) (p.253). Moreover, systematic evaluation of the effectiveness of CALL must continue (Dunkel, 1987). Hence, this study investigated the effectiveness of implementing the blended learning in ESP training program by not only assess students' English learning performance gains, but also taking students' attitudes toward learning English with CALL and their perceptions of CALL as facilitating interactions among students into account.

Aspects of Second Language Learners in Learning with CALL

Experience with computer technology.

Hall (1998) indicates that the optimal amount of grammar teaching varies depending on the factors, such as, age, gender, level in the foreign language, purpose of learning the language, cognitive ability, and motivations. Peterson (1999) conducted a needs analysis on students' needs of English CALL systems showed that students were interested in employing CALL software to improve their listening, speaking, and writing skills. Additionally, Peterson's (1999) study shows that CALL systems are welcomed by the students to be utilized during class time and the CALL systems are also welcomed by the faculty to improve students' English language skills. However, Cushion and Hémard's (2000) study shows that for both students and faculties, if they had little expertise, consideration, time, and interest in CALL, they seldom and artificially interacted with such CALL learning environment (p.115).

The finding of Bueno et al. (1999) shows that as students gained experience with the CALL software, more complex interaction preferences evolved. That is, students who had experience with the CALL software tends to have enhanced navigational skills and language skills (Bueno et al., 1999). Bueno et al. (1999) argued with the focus on the usability principles for educational software designs, unless restrictive design features are included, "learners will not always use the features of the software in the ways that designers anticipate" (p.284). Therefore, careful design and testing is necessary to ensure that learners are using the software effectively (Bueno et al., 1999). This study also collected data on participants' years of prior computer experience for the language learning purposes.

Level of proficiency.

Grace (2000) suggests future research should also focus on studying the learners' level of proficiency; the author indicates, "as learners develop their lexicon and knowledge of the structure of the L2, they can make correct inferences more easily" (p.221). Moreover, Davies and Williamson (1998) suggest that students learn at different speeds, "some will bring more previous knowledge of the target language to the learning environment than others" (p.13). Therefore, this study intend to collect the data on participants' years of prior experience studying English and years of training experience in the field of aviation to determine if these two variables affect their English learning performance gains.

Peer learning and cooperation.

Cooperation is one of the social strategies within learners' language learning (Bull, 1997). Dörnyei (1997) stated, "The instructional use of small groups in order to

achieve common learning goals via cooperation has made an almost unprecedented impact in education during the last two decades" (p. 482). Cushion and Hémard's (2000) study shows that students of language learning would like computers to provide a greater interactive combination of grammatical structures and individual practice (p.109). Bull (1997) indicates that cooperation usually implies the idea of working with other peers in the CALL system. That is, students would be working together with the system to clarify their knowledge and beliefs (Bull, 1997).

"It becomes clear that the computer does foster talk between learners" (Mydlarski, 1998, p.130). Mydlarski (1998) defines pear learning as "people working together toward a common goal" (p.125). In addition, Mydlarski (1998) indicates that sharing a computer does make sense socially, cognitively, and economically (p.126). The cooperative model of CALL has the ability to let students make errors without being criticized, to negotiate meanings and to try out the hypotheses by providing non-threatening context (Mydlarski, 1998). Mydlarski (1998) argues that the non-threatening learning context of CALL results in a high degree of interaction.

Mydlarski (1998) further indicates that language learners can participate in a variety of cooperative CALL activities, such as, collaborative writing and computer-mediated communication (p.128). However, to achieve this, academic tasks and social situations need to be structured by the teachers to increase the quality and the richness of language learning (Mydlarski, 1998). There are advantages of applying the Cooperative Computer-Assisted Language Learning (CCALL) to language learners (Mydlarski, 1998). "Within the group work, students can suggest, clarify, disagree, initiate, judge, manage, and teach" (Mydlarski, 1998, p. 127). In addition, explaining something to

someone else often leads to cognitive restructuring, that is, while we talk, our minds change (Mydlarski, 1998).

Students tend to re-examine their own understanding and seek resolutions when the conceptual conflicts occur (Mydlarski, 1998). These conceptual conflicts have potential for highly productive learning in a second language learning setting (Mydlarski, 1998). Sanders and Kenner's study indicated that verbalizing some of the interactions among ESL learners helps learners to find out from their friends how to use computer and what was available on it, in which students perceived as beneficial in ESL learning (as cited in Mydlarski, 1998). Therefore, this study expected that the experimental group would perceive positively that CALL technology as facilitating interactions among learners. In addition, this study intended to collect data on the amount of time that the ESL students of the experimental group communicated in English among themselves for further in-depth analyses.

Motivations.

Dörnyei (1997) indicated, "Cooperative goal structure and the learning format that characterize Cooperative Learning generate a special motivational system, which is largely responsible for the efficiency of CL" (p. 487). Macintyre, Clément, Dörnyei, and Noels (1994) stated "by engendering a *willingness* to communicate, language instruction may achieve its social and political goal of bringing cultures into contact and nations together" (p. 558). Language learners have different learning reasons and motivations (Oxford & Shearin, 1994). There are two general types of motivation, intrinsic and extrinsic motivations (Noels, Pelletier, Clément, & Vallerand, 2003). "Intrinsic motivation (IM) generally refers to motivation to engage in an activity because that

activity is enjoyable and satisfying to do" (Noels et al., 2003, p. 38). Oxford and Shearin (1994) indicate that integrative and instrumental reasons are frequent motivators for second language learners. Crookes and Schmidt indicate that both instrumental and integrative motivations are parts of extrinsic motivation (as cited in Aacken, 1999). "Extrinsic motivation is motivation to work for an external reward such as money, prizes, grades, positive feedback or to avoid punishment" (Aacken, 1999, p. 115).

In addition, Gardner (as cited in Oxford & Shearin, 1994) has no longer treated the primacy of integrative motivations as essential or meaningful motivations for learners to second language learning, but many people in the language field do not realize this. The instrumental motivations theories imply that second language learners engage in instrumental activities to achieve valued outcomes (Oxford & Shearin, 1994). That is, the instrumental motivations as the desires to learn the second language as a tool for a career in the future (Aacken, 1999). Moreover, the integrative motivation is defined "as an interest in the L2 community" (Aacken, 1999, p. 114).

On the other hand, Ramage (as cited in Noels et al., 2003) found that "continuing students were more motivated to learn language for language's sake-that is, they were more intrinsically motivated-than discontinuing students." Furthermore, Ramage also found that "discontinuing students had a stronger interest in language learning as a means to other goals" (p. 75). Moreover, Matsukawa and Zhong found that "Japanese students' interest in English was related to increased intrinsic motivation, more determination to achieve better English scores, and a greater likelihood of achieving high scores" (as cited in Noels et al., 2003, p. 75).

Davies and Williamson (1998) argue that motivations of language learning are the core condition of individualized learning, which is the "interactivity" element of CALL systems between computers and learners (p.15). Aacken (1999) attempted to correlate second language learners' motivations and their attitudes toward learning the second language with CALL technology. The motivations for students studying Kanji in Aacken's (1999) study include: "for definite future career", "likes traveling", "become a better educated person", "for possible future career", "likes language learning", "wants to live in Japan", "to gain respect from others", "to interact with Japanese people", "likes studying Japanese way of life", "to meet various people", "was advised to study Japanese", "meet course requirement", and "friends are studying".

The motivation of "liking language learning" is an intrinsic motivation and the motivations of "wants to live in Japan", "to interact with Japanese people", "likes traveling", and "to meet various people" are integrative motivations; all the other above motivations are instrumental (Aacken, 1999). This study adopted Aacken's (1999) study with some modifications for the variables of learners' motivations for learning English and their attitudes toward learning English with CALL technology via surveying the experimental group.

Gender.

"One learner variable that may play a role in L2 learning is gender" (Grace, 2000, p.214). That is, some studies have shown that men may find a pure second language-learning environment less congenial than females, in which males tend to prefer to know the meaning of words and females tend to guess by utilizing the contexts (Grace, 2000). Ehrman and Oxford's (1989) study on the effects of gender differences on adult language

learning strategies found that women used more learning strategies than men did. Women showed more preference feeling than men did; moreover, "feelers show a statistically clear superiority in general strategies and a suggestive advantage in social strategies" (Ehrman & Oxford, 1989, p. 8).

However, there are conflicting findings regarding the significant difference between males and females in learners' learning strategies and behaviors (Grace, 2000). Moreover, Grace's (2000) study finding shows that male and female learners do benefit equally from the CALL lessons that implement translations available, and both female and male learners benefit equally from the pure second language-learning lesson. Therefore, the gender variable that this study collected was simply for collecting students' demographic information and the 18 participants in this study were all males.

Translation availability.

"Translation here refers to more or less word-for-word translation" (Bull, 1997, p.14). In addition, Grace's (2000) study indicates that a CALL lesson that provides translations could facilitate learners' overcoming the difficulties of either guessing the words or the contexts of the second language text. To support this argument, Grace's (2000) study shows that students who have a translation system available in the CALL lesson tend to have higher scores than the students, who do not have the translation implemented into their CALL lesson. On the other hand, Bull (1997) argues that translation is not necessarily positive and speakers who are more fluent tend not to translate from their first language when speaking in foreign language (p. 6). This study intended to investigate the effectiveness of the instruction method of blended learning as a whole and it did not intend to investigate specific functions of the CALL system;

therefore, the helpfulness of the translation function of the CALL systems was not included in the study.

Online Learning

"E-learning is an extremely cost-effective, efficient method for providing training, giving employees the chance to learn at their own speed and take a class when it won't interfere with productivity" (Mitchell, 2000). In addition, "E-learning can be available 24 hours a day, 365 days a year" (Hartley, 2000, p. 37). Moreover, Aldrich (2000) stated, "The market for customer-focused e-learning is poised for such staggering growth that by 2003, more than 40 percept of e-learning activities will be aimed at external customers" (p. 34). Redmon and Salopek (2000) indicated that e-learning helps to eliminate the expenses for room rental, handouts, equipment, and travel by allowing companies or institutions to "build the course once, then deliver it simultaneously to multiple locations-all at a fixed cost" (p. 37).

Increasingly, educational institutions are feeling the impact of personal computers and the Internet (Saxena, 2000). Schmidt (2000) indicates that distance learning will transform post-secondary education. In addition, Symonds (2000) stated "the vast majority of the education establishment--from the teachers' unions to administrators to the Education Dept.--is jumping on the bandwagon, if for no other reason than the sweeping impact technology has already had on society" (p. 117). Furthermore, "four years after starting the E-rate program, which doled out $6.4 billion to help schools and libraries to connect to the Internet, a federal commission is suggesting ways for school districts to take the next step"; "the commission wrapped up three years of research by

stating seven broad policy goals that together call for making e-learning a vital part of the national education agenda" (Dessoff, 2001, p. 32).

"Once referred to as distance learning, the ability to take course using the Internet, computers, networking, and multimedia technologies from a remote location is today referred to as e-learning" (Quan, 2000). Language learners have the opportunities to use the communication tools, such as e-mail, bulletin boards, and video conferencing to interact and communicate between remote learners using the target language (Harrison, 1998). However, the "development of effective online interventions for so-called soft skills learning is still in its infancy" (Lewis & Orton, 2000, p. 48).

There are two distinctive uses of Internet in foreign language learning: agentive and instrumental (Harrison, 1998). The agentive language learning software has the following characteristics: the content is simplified and the interaction is limited to the computer's capabilities; that is, the computer is an add-on feature of the language course (Harrison, 1998). The agentive software includes the implementation of network computers that makes the CALL software available for downloading via the Internet, in which the interaction process is between computers and learners (Harrison, 1998, p.438). Practice session that employs multiple-choice is an example of interaction fostered by the agentive software in the language learning process (Harrison, 1998).

On the other hand, instrumental use of the computer occurs when the language learners use the computer as a tool to carry out learning tasks (Harrison, 1998). Harrison (1998) indicated that instrumental software is developed for the real-world tasks. Word processors, spreadsheets, local-area networks, World Wide Web, e-mail, teleconferencing are examples of instrumental software to be employed in the foreign language learning

that makes foreign language learning environment linguistically rich (Harrison, 1998). Both agentive and instrumental language learning software was employed in this study.

Roles of CALL in Assisting Language Learning

De Ridder (2000) argues that the reading text on a computer screen does not appear to be the same as reading on paper. Instead of reading on screen text, readers often find themselves turning to the printed pages (De Ridder, 2000). However, De Ridder's (2000) study shows that there is no significant learners' retention rate difference between reading from the on screen highlighted text and the unmarked on screen text. In second language learning, De Ridder (2000) argues that reading helps learners to interact with different cultures, in which semantic and syntactic information can be learned and remembered through the reading process. De Ridder's (2000) study shows that learners who read from the highlighted on screen text tended to remember more words than the text which is not highlighted.

Hall (1998) indicates that there are several advantages for learners to use foreign language word processing tools, such as, spell check, thesaurus, and hyphenation programs. In Mydlarski's (1998) cooperative CALL study, the computer's role in writing is usually a function of the word processor, which has the ability to provide a highly functional writing and learning environment (p.130). Pugh (1997) indicates that CALL's spell-checkers and text-parsers functions play valuable roles in saving teachers time in the time-consuming tasks of correcting students' grammatical errors. CALL's function of word processors also facilitates computing less intimidating to the techno phobic colleagues, who like to think of themselves as modern day scribes (Mydlarski, 1998).

Moreover, Mydlarski (1998) suggests that collaborative writing does generate verbal interactions.

Electronic dictionaries are now available and are useful tools for learners writing on word processors; these electronic dictionaries also contain some grammatical information (Hall, 1998). However, Hall (1998) further argues that electronic grammars can only be used effectively by learners who have some knowledge of grammatical terminology.

Language learners no longer solely rely on the minimum interactions with native speakers; the exchanges between language learners have the potential of bringing authenticity and meaningfulness of the communicative role in learning the target language (Harrison, 1998). Bauman (1998) argues that e-mail is a powerful tool for teachers and students in language learning. Using e-mail in language teaching enhances the student-teacher communication, which provides teachers with student-produced electronic texts (Bauman, 1998).

CHAPTER III

METHODOLOGY

The purpose of the current study was to examine the effectiveness of the implementation of online learning Computer-Assisted Language Learning (CALL) systems blended with an instructor (blended learning) in the English for Specific Purposes (ESP) training program. To examine the effectiveness of the implementation of blended learning, this study compared and analyzed the pretest and posttest scores on the Aviation English Placement Exam (AEPE) of a group of 18 Chinese adult male flight students who were enrolled in a corporate blended learning Aviation English training program. In addition to the AEPE, a survey was developed to collect data before and after two months of Aviation English training.

Chapter 3 describes the methods and procedures employed to conduct the investigation of the effectiveness of the implementation of the blended learning in the ESP training program. This chapter includes: research questions and hypotheses, design of the study, selection of the participants, instruments, collection of the data, and the statistical procedures used to analyze the data.

Research Question and Hypotheses

Research Questions

Descriptive and inferential research questions were investigated:

Research Question 1: To what extent is there a significant difference between the pretest and the posttest scores of students who are enrolled in the English for Specific Purposes (ESP) training program implemented with the online learning Computer-

Assisted Language Learning (CALL) technology blended with an instructor in the classroom (blended learning)?

Research Question 2: To what extent is there a significant difference between the pretest and the posttest scores of students who are enrolled in the blended learning ESP training program in the areas of listening, reading, vocabulary, and grammar components of the test?

Research Question 3: What are the attitudes of students who are enrolled in the blended learning ESP training program, toward learning ESP with CALL technology?

Research Question 4: To what extent do students perceive the CALL technology as facilitating interactions among students in learning ESP?

Research Question 5: Do students' educational levels, age, years of prior computer experience, years of experience studying English, their perceptions of CALL technology as facilitating interactions among students, or their motivations affect their attitudes toward learning ESP with CALL technology?

Research Question 6: Do students' educational levels, age, years of prior computer experience, years of experience studying English, years of aviation training experience, amount of time viewing TV and movies, amount of time of students' interactions with native English-speakers, amount of time they communicated in English among themselves, their motivations, their perceptions of CALL technology as facilitating interactions among students, or their attitudes toward learning ESP with CALL affect their score gains?

Rationales and Assumptions

The purpose of this study was to examine the effectiveness of implementing blended learning in the English for Specific Purposes (ESP) training program. The rationale for the posttest scores of students who were enrolled in the blended learning English for Specific Purposes (ESP) training program, was assumed to be greater than their pretest scores. In addition, the rationale for the posttest listening, reading, vocabulary, and grammar test scores of the students who were enrolled in the blended learning ESP training program were assumed significantly greater than their pretest scores. Students, who were enrolled in the blended learning ESP training program, were assumed to have positive attitudes toward learning ESP with CALL technology.

Students' years of prior computer experience was assumed to have positive effects on their attitudes toward learning ESP with CALL technology and their score gains. In addition, it was assumed that the higher the students' education levels, the more positive would be the effects on their score gains. Students' motivations were assumed to affect their attitudes toward learning ESP with CALL technology and their score gains. Students' ages was assumed to affect their attitudes toward learning ESP with CALL technology and their score gains.

Students' prior years of experience studying English was assumed to affect their attitudes toward learning ESP with CALL technology and their score gains. It was assumed that students would perceive that the CALL technology facilitated interactions among students in learning English for Specific Purposes. Students' perceptions of CALL technology as facilitating interactions among students were assumed to have positive effects on their attitudes toward learning ESP with CALL and their score gains. It was

assumed that students' attitudes toward learning ESP with CALL technology would affect their score gains. Students' years of aviation training experience was assumed to have positive effects on their score gains. Students' amount of time of their interactions with native English-speakers was assumed to have positive effects on their score gains. Students' amount of time they communicated in English among themselves was assumed to have positive effects on their score gains. Finally, students' amount of time viewing TV and movies was assumed to have positive effects on their score gains.

Hypotheses

The following hypotheses guided the research of this study:

Ho 1: There will be no significant difference between the pretest and posttest scores of students who are enrolled in the English for Specific Purposes (ESP) training program implemented with the online learning Computer-Assisted Language Learning (CALL) technology blended with an instructor in the classroom setting environment (blended learning).

Ho 2: There will be no significant difference between pretest and posttest scores of students who are enrolled in the blended learning ESP training program in the areas of listening, reading, vocabulary, and grammar components of the tests.

Ho 3: There will be no significant relationship between students' years of prior computer experience and their attitudes toward learning ESP with CALL technology.

Ho 4: There will be no significant relationship between students' years of prior computer experience and their score gains.

Ho 5: There will be no significant relationship between students' perceptions of CALL technology as facilitating interactions among students and their attitudes toward learning ESP with CALL technology.

Ho 6: There will be no significant relationship between students' perceptions of CALL technology as facilitating interactions among students and their score gains.

Ho 7: There will be no significant relationship between students' education levels and their attitudes toward learning ESP with CALL technology.

Ho 8: There will be no significant relationship between students' education levels and their pretest or posttest scores.

Ho 9: There will be no significant relationship between students' ages and their attitudes toward learning ESP with CALL technology.

Ho 10: There will be no significant relationship between students' ages and their pretest or posttest scores.

Ho 11: There will be no significant relationship between students' prior experience studying English and their attitudes toward learning ESP with CALL technology.

Ho 12: There will be no significant relationship between students' prior experience studying English and their score gains.

Ho 13: There will be no significant relationship between students' motivations of learning English and their attitudes toward learning ESP with CALL technology.

Ho 14: There will be no significant relationship between students' motivations of learning English and their gains.

Ho 15: There will be no significant relationship between students' attitudes toward learning ESP with CALL technology and their gains.

Ho 16: There will be no significant relationship between students' years of aviation training experience and their score gains.

Ho 17: There will be no significant relationship between students' amount of time of their interactions with native English-speakers and their score gains.

Ho 18: There will be no significant relationship between students' amount of time they communicated in English among themselves and their score gains.

Ho 19: There will be no significant relationship between students' amount of time viewing TV and movies and their score gains.

Study Design

Design of the Study

A "one-group pretest-posttest design" (Gall et al., 1996, p. 491) study was conducted to evaluate the pretest and posttest scores of trainees who were enrolled in the blended learning English for Specific Purposes training program. The one-group pretest and posttest design of Semel and Wiig's (1981) study on the training effects among children with language-learning disabilities was the framework research design of this study. Semel and Wiig (1981) used this research design to conduct their study because in the school system differential services were not permitted for students. "The one-group pretest-posttest design is appropriate when you are attempting to change a characteristic that is very stable or resistant to change" (Gall, et al., 1996, p. 492), for instance, learning a second language. The one-group pretest and posttest design was employed to examine the effectiveness of implementing the blended learning in ESP training program.

Semel and Wiig (1981) employed the "one-group pretest-posttest design" (Gall, et al., 1996, p. 491) to determine whether the new training program, Semel Auditory Processing Program (SAPP), could improve the language processing abilities among children with language-learning disabilities. In the "one-group pretest-posttest design," the threat of internal validity due to the absence of the control group was not serious because Semel & Wiig (1981) were able to estimate the expected pretest-posttest score gain under normal conditions (Gall, et al., 1996). The experimental group was the students who were enrolled in the blended learning English for Specific Purposes (ESP) training program. Akin to Semel and Wiig's (1981) study, this research study intended to evaluate the experimental group's pretest and posttest score gains of students who were enrolled in the blended learning ESP training program to determine the effectiveness of the specific instructional method. This study employed the one-group pretest-posttest design to conduct the research and to test its hypotheses.

A survey instrument was developed to collect the data on students' basic background information regarding their "ages", "gender", "amount of their interactions with native English-speakers", "amount of time viewing TV and movies", "amount of time they communicated in English among themselves", "years of computer experience", "years of experience study English", "years of aviation training experience", "highest educational levels". Questions regarding students' "attitudes toward the CALL systems", "motivations for study English and their "perceptions of CALL technology as facilitating interactions among students" were also included in the survey.

Moreover, only the students who were enrolled in the participating blended learning Aviation English training program filled out the questionnaires. Questionnaires

were in the forms of close-ended statements with 5-point Likert scale attitude responses, checklists items, and open-ended questions. Open-ended questions were also included in the survey to provide participants the opportunities to express their opinions about the survey instrument. The researcher administered the survey instruments in both English and Chinese languages to ensure the comprehensibility.

Important Terms

- Blended learning: Implementing the online-learning Computer-Assisted Language Learning blended with an instructor in the classroom-setting environment.
- CALL: Computer-Assisted Language Learning, CALL is "referring to applications written specifically for language learning purpose" (Hall, 1998, p. 42).
- CAI: Computer-Assisted Instruction.
- CCALL: Cooperative Computer-Assisted Language Learning.
- CL: Cooperative Learning (Dörnyei, 1997).
- ESL: English as Second Language.
- ESOL: English for Speakers of Other Languages or English as a Second or Other Language.
- ESP: English for Specific Purposes.
- HRD: Human Resource Development.
- ROI: Return On Investment.
- SAPP: Semel Auditory Processing Program (Semel & Wiig, 1981).

Variables

The effectiveness of a particular ESP training program implemented with blended learning instructional method was examined by evaluating students' pretest and posttest

test scores on the Aviation English Placement Exam (AEPE). Variables of "prior experience of working with computers "," prior experience studying English and "aviation training experience" will be measured in number of years. The "amount of time students interact with native English-speakers", "amount of time students communicated in English among themselves", and the "amount of time viewing TV and movies" variables were measured in number of hours per week. In addition, the data of students' "highest educational degree", "motivations for study English", "students' perceptions of CALL technology as facilitating interactions among students", and "students' attitudes toward CALL" were collected.

Operational Definitions

Pretest and posttest scores: the assessment tool that was employed in this study to measure participants' pretest and posttest scores of their English proficiency was the Aviation English Placement Exam (AEPE). The length between pretest and posttest was two months. The AEPE measures students' English proficiency performances in listening comprehension, reading comprehension, vocabulary, and grammar components of language learning. The AEPE test scores were in the measurement of continuous data, which ranges from 0 to 100.

Age: the "age" variable was filled out by the participants in the measurement of continuous data, which was measured by years of age.

Gender: the "gender" variable was in the measurement of nominal data.

Amount of time of students' interactions with native English-speakers: the variable of "amount of interactions" was in the measurement of the continuous data,

which was measured by the number of hours per week that the students interacted with native English-speakers other than their instructors.

Amount of time viewing TV and movies: the variable of "viewing TV and movies" was in the measurement of the continuous data, which was measured by the number of hours per week that the students watched television and went to movies.

Amount of time communicated in English among students themselves: the variables of "communicated in English among ESL students" was in the measurement of continuous data, which was measured by the number of hours per week that students communicated in English among learners themselves.

Years of prior computer experience: students' prior computer experience was in the measurement of continuous data, which was measured by the number of years that students have worked with computers for language learning purposes.

Years of prior experience studying English: students' prior experience studying English was in the measurement of continuous data, which was measured by the number of years that students have been studying English.

Years of aviation training experience: participants' years of aviation training experience was in the measurement of continuous data, which was measured by the number of years that the participants have been involved in the aviation training.

Highest educational level: the variable "educational level" measures students' highest earned degree. The education level was measured via the usage of ordinal scales, from 1 "high school or equivalent" to 3 "graduate or above".

Attitudes toward CALL: the variable "attitudes toward CALL" was measured by series of statements to measure students' perceptions of learning English with CALL

technology. The statement such as "I find that learning English with Computer- Assisted Language Learning technology is beneficial." The responses for this statement were on a 5-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree".

Interaction: the variable "interaction" is defined as students' perceptions of CALL technology as facilitating interactions among students in learning English, which was measured by the form of a statement: "I feel that studying English with Computer-Assisted Language Learning technology facilitates interaction for me personally with other English as Second Language students in the classroom". The responses for this statement were on a 5-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree".

Motivations: the variable "motivations" for this study is defined as reasons for English for Speakers of Other Languages learners to learn English. The variable "motivations" was measured by series of statements with different instrumental motivations, integrative motivations, and an intrinsic motivation "like language learning" to measure students' motivations for learning English in this study. The responses for this statement were on a 5-point Likert scale ranging from 1 "strongly disagree" to 5 "strongly agree".

The motivations theoretical framework was based on Oxford and Shearin's (1994) work on language learning motivations. Oxford and Shearin (1994) indicate that the integrative and instrumental reasons are frequent motivators for second language learners. The instrumental motivations theories imply that second language learners engage in instrumental activities to achieve valued outcomes (Oxford & Shearin, 1994). Integrative motivation is defined as an interest in the second language community, and

the instrumental motivation is defined as a desire to learn the second language as a tool for a career in the future (Aacken, 1999, p. 114).

Moreover, Crookes and Schmidt suggested that both integrative and instrumental motivations are both parts of extrinsic motivation, that is, both motivations are concerned with goals and outcomes (as cited in Aacken, 1999, p. 116). Extrinsic motivations are the behaviors that the individual performs to receive some extrinsic reward or to avoid punishment (Dörnyei, 1994, p. 275). The integrative motivation "is associated with a positive disposition toward the L2 group and the desire to interact with and even become similar to valued members of that community" (Dörnyei, 1994, p. 274). Dörnyei (2003) indicates that integrative motivation implies openness and respect for other cultural groups and ways of life. The instrumental motivation "is related to the potential pragmatic gains of L2 proficiency, such as getting a better job or higher salary" (Dörnyei, 1994, p.274).

Further, Gardner (as cited in Oxford & Shearin, 1994) has no longer treated the primacy of integrative motivations as essential or meaningful motivations for learners to second language learning. Dörnyei (1994) believes that "the instrumental motivation is a central component of L2 motivation where it is relevant, that is, where relatively short-term pragmatic, utilitarian benefits are actually available for the learners" (p. 520). Several studies suggested that instrumental motivation may be stronger in learning English as a second language, and students without integrative motivation learned better in some cases (Aacken, 1999). Moreover, Dörnyei's (1990) study also showed that the instrumental motivation played an important role in learning English. In addition, Clément et al. (1994) found that integrative motivation showed little relationship to the

teaching environment (p. 441). Therefore, this study focused primarily on the instrumental motivations for second language learners to learn English for a Specific Purposes.

Intervention

The intervention of this research study was the implementation of the online learning Computer-Assisted Language Learning technology blended with an instructor in the classroom setting (blended learning) English for Specific Purposes training program. This study employed the "V" company's online learning CALL technology that is designed for both distance learning and in class ESP training programs. The "V" company that develops the online learning CALL technology has implemented the technology in its online ESP training programs.

"V" company is an online company that offers different virtual English for different purposes training programs to company employee training and individuals' self-development. "V" company's online learning CALL technology that is being implemented in the classroom setting Aviation English training program was the intervention of this study. The participating institution in this study that offers the Aviation English training program implemented with the "V" company's online learning CALL technology blended with an instructor in the classroom began the implementation during Spring, 2004. The students of the experimental group were divided into morning and afternoon classes because of the capacities of the classroom and the diverse schedules of students' flight training activities.

The implementation of "V" company's blended learning instructional method was the intervention of this study. An instructor was teaching both morning and afternoon

classes. The blended learning Aviation English instruction involved 1 hour of classroom and 1 hour CALL daily instructions, 5 days per week. The characteristic of the implementation of the blended learning Aviation English training program included:

First, the instructor followed the "scaffolding" (Echevarria & Vogt, 1996) instructional techniques in the classroom session with verbal prompt of discussions, asking for elaboration, and clarification of spoken sentences. During the classroom sessions, the instructor regularly paused. The purpose of frequent pauses was to provide students with the opportunities to interact with the instructor via asking questions in the English language and the instructor could give immediate corrective feedbacks to students in the target language.

The purposes of the interactions with the instructor were to give students immediate feedback to their raised questions and to response to their difficulties in listening. In addition, the interactions also served as opportunities for the students to observe the communication styles that native English-speakers spoke. Furthermore, the instructor asked students to repeat the sentences that were spoken by the instructor, in order to obtain students' responses and promote interactions. Within the teacher-student interactions, the elaborated responses were encouraged.

Second, all the students were requested by the instructor to write e-mails to the instructor on a daily basis. The instructor read the e-mails from all the students to assess the improvements of each student's writing and grammar skills; subsequently, the instructor replied to the e-mails for the students to read. The purpose of replying to the e mails to students was to develop students' English reading comprehension and to reinforce correct grammar.

Third, Aviation English training software was employed in the CALL instructions. All the computers in the computer lab had network capabilities that provided Internet access to the students. CALL lessons were loaded in "V" company's mainframe computers. Students must log on to the company's network to gain access to the CALL exercises. There were three different exercises in the CALL instruction designed to match students' different proficiency levels. Students' proficiency levels in aviation English were based on their pretest scores on the AEPE. Categorized and clickable topic titles were included in the main menu of the CALL exercises. By clicking on a desired topic, pre-designed audio clips would be played. In addition, the text version of the audio clips would also be shown on the screen. Students followed the on screen texts to listen and repeat the sentences on the headphones. The audio clips simulated the actual situations and conversations that might occur before and during the flights, as well as during and after landing the aircraft.

Intervention Delivery

An instructor delivered the intervention of the blended learning in the Aviation English training program. The "V" company's online learning CALL technology was employed in the Aviation English training program; in addition, the computer and multimedia equipment were utilized throughout the training sessions. The instructor delivered the same instructional methods to all the participants in the study. The training facilities, multimedia equipment, and the computers provided by the participating flight academy were the same for both classes. The time between pretest and posttest for this study was two months.

Confounding Variables and Methods of Control

There are eight types of extraneous variables or threats to the internal validity of the experimental design: selection, selection by maturation interactions, regression, maturation, history, testing, instrumentation, and mortality (Mitchell & Jolley, 1996, p.129). The "selection" and "selection by maturation" threats to the internal validity of the experimental designs are automatically eliminated in the one-group pretest-posttest design, since the participants are tested against themselves (Mitchell & Jolley, 1996, p.371). Mitchell and Jolley (1996) suggest standardizing the administration of the measure in order to minimize the "instrument" threat to the internal validity of the experimental designs. This study standardized the way to administer the measure. Furthermore, this study did not select participants based on extreme scores; therefore, the "regression" threat to the internal validity of the experimental designs was minimized (Mitchell & Jolley, 1996, p.371).

According to Mitchell and Jolley (1996), the "mortality" threat to the internal validity of the experimental designs is not a problem if participants do not drop out. To deal with occurrences of participants dropping out, the study needs be conducted over short period of time (Mitchell & Jolley, 1996). Minimizing the time between pretest and posttest can minimize the "mortality", "maturation", and "history" threats to the internal validity of the experimental designs (Mitchell & Jolley, 1996, p.371). The length of the intervention for this study was minimized to two months of instructions. In addition, since the participants were sent by their companies from China to be enrolled in the participating blended learning corporate Aviation English training program, no participant in the study dropped out of the program.

The variables of "amount of time of students' interactions with native English-speakers" and the "amount of time students view TV and movies" were the confounding variables in this study. To minimize the effects of the confounding variables, all the participating students were living in the school-provided dormitories. A group of eight students lived together in a suite and all the 18 participants lived with other participating students in the school-provided suites. Each suite had its own kitchen and living room, which minimized the opportunities for participants to interact with native English-speakers. In addition, students did not have their own transportation and they had little opportunity to go outside of the institution, which also minimized the effects of the confounding variables.

Strengths and Limitations of the Design

One limitation of the study was the absence of the control group. In this professional training school, different instructional services to students were not available. Therefore, all the participants in the experimental group of this study were learning Aviation English with blended learning instructions. Moreover, the institution that agreed to participate in this study did not offer online learning Aviation English training programs to its students. Hence, the ideal control group of participants who were enrolled in the online learning ESP training programs that were provided by the same institution, taught by the same instructor, during the same period as the experimental group was not available to the researcher.

Limited number of participants was another limitation of this study. The results of this study cannot be generalized to all the English for Speakers of Other Languages learners who were enrolled in the blended learning Aviation English training programs,

as only a group of adult ESOL students from China was employed in this study. In addition, this study was also limited to the extent that the instruments used in this study were generalizable and valid in other situations.

The strength of the one-group pretest-posttest design is when the study attempts to change a stable characteristic (Gall, et al., 1996). "The one-group pretest-posttest design is appropriate when you are attempting to change a characteristic that is very stable or resistant to change" (Gall, et al., 1996, p. 492). The characteristic that is stable or resistant to change in this study is the English as second language learning or English for speakers of other languages. Semel and Wiig (1981) employed the "one-group pretest-posttest design" (Gall, et al., 1996, p. 491) to determine the effectiveness of the new training program, SAPP, to determine if the new program would improve the language skills of children with language-learning disabilities. Semel and Wiig (1981) employed this pre-experimental research design in the school system in which differential services were not permitted for students. Akin to Semel and Wiig's (1981) study, this study employed the one-group pretest-posttest pre-experimental design to examine if the implementation of the blended learning in ESP training program would improve second language learners' English language skills. The pretest and posttest scores of the experimental group were statistically analyzed and compared.

Instrumentation

Instruments and Other Measurement Devices and Procedures

The instrument for this study to measure participants' pretest and posttest scores was the Aviation English Placement Exam (AEPE), the standardized test for the participating ESP training program. The AEPE test was included in the participating

training program's regular curriculum and it was used by the instructor of the experimental group to assess learners' English performances. The AEPE measures students' aviation English performances in listening comprehension, vocabulary, reading comprehension, and grammar components of language learning. The AEPE test score ranges from 0 to 100 points.

In addition to the AEPE instrument, a survey instrument was developed to collect participants' background information and to measure trainees' attitudes toward learning ESP with the CALL systems, their motivations for study English, and their perceptions of CALL as facilitating interactions among students. Demographic data regarding age, gender, highest educational level, amount of time of their interactions with native English-speakers, amount of time students communicated in English among themselves, years of experience with computers, years of aviation training experience, years of prior experience studying English, and amount of time viewed TV and movies were collected via the survey. Both the AEPE and survey instruments were employed in this one-group pretest-posttest design study.

Rationale for Selection of Instruments

The rationale for selecting the Aviation English Placement Exam (AEPE) was because it was the standard test for both the "V" company's online learning Aviation English training programs and the participating classroom setting Aviation English training program implemented with the "V' company's online learning CALL technology. In addition, the AEPE was able to produce the same scale of measurement to measure learners' Aviation English performances for both online and in class training programs. By employing the AEPE as the instrument to assess students' Aviation English

performances, participants' pretest and posttest scores of the participating Aviation English training program that implemented "V' company's online learning CALL systems blended with an instructor could be produced.

Reliability and Validity of Aviation English Placement Exam (AEPE)

The Aviation English Placement Exam (AEPE) was developed by Dr. Judith B. Strother and Dr. Randall L. Alford. Dr. Alford has developed ESL materials for the Florida Department of Education and serves as a language consultant for the U.S. Department of Education. Dr. Strother has developed variety of materials in specialized areas of ESL such as business, pilot training, and sciences. The AEPE was field tested for bias and clarity before it was employed by the participating training program to assess students' Aviation English achievement. The validity of the AEPE was established during the development of the instrument by Dr. Strother and Dr. Alford.

The development of the AEPE as follow: (1) all glossary items were extrapolated from the Reading Selection in Aviation English, (2) items were randomly selected that appear most frequently, (3) all test items were carefully crafted to incorporate the content vocabulary in the corpus of the instrument, (4) the AEPE was field tested for bias and clarity by non-native English-speakers, (5) and finally, any item that was consistently "branded" as questionable by test takers; it was either reworded or the item was deleted from the instrument. The reliability of the instrument was established for the study sample. The SPSS software was employed to analyze the reliability of the AEPE test instrument.

Development of Survey

The survey that was developed in the Chinese language to collect participants' background information, their motivations for studying English, their perceptions of CALL as facilitating interactions among students, and their attitudes toward learning English with the CALL technology. Chinese is the participants' primary language. The development of the survey instrument began with developing the questionnaires in the English language and then translated them into Chinese by the researcher, whose primary language is also Chinese. In addition, a pilot test was conducted to make certain that the instrument was valid and reliable, and the translation was comprehensible. Both English and Chinese versions of the survey were available to all the participants in the experimental group. Participants of the survey had the choice of choosing to take either the English version or the Chinese version of the survey. The instruction of how to fill out the questionnaires was verbally delivered to all the participants in both English and Chinese languages by the researcher to ensure the comprehensibility.

The variables of "previous exposure to computers ", " attitudes toward computer technology, and the "educational background" that were identified and operationalized by Choi, et al.'s (2003) were the framework of variables to be measured in this study. The questionnaires to measure participants' "years of prior computer experiences", "educational level", and their "attitudes toward learning English with CALL technology" were adopted from Choi, et al.'s (2003) study, and some modifications were made for this study.

The variables of "exposure to the language", "motivations", "interactions", and students' "perceptions on learning English with CALL systems" that were identified and

operationalized in Leahy's (1998) study were the frameworks of variables to be measured in this study. Oxford and Shearin's (1994) work on language learners' learning motivations was the framework for learners' motivations questionnaire development in this study. Aacken's (1999) study of correlating second language learners' motivations and their attitudes toward learning the second language with CALL technology was another framework for the questionnaire's development for this study. The questionnaires to measure the above variables were adopted from Leahy (1998), Aacken (1999), and Oxford and Shearin's (1994) studies, and some modifications were made for this study.

Population and Sample

Sampling

This study attempted to examine the effectiveness of implementing the blended learning in English for Specific Purposes training program via evaluating the experimental group's pretest and posttest scores. The study population of this research was the foreign flight students who were enrolled in the blended learning Aviation English training programs in Florida. The sample for this study was 18 Chinese adult male flight students who were enrolled in the blended learning Aviation English training program, offered by a flight academy located in central Florida.

The convenience sampling method was utilized for this study. Among professional schools, it was difficult to locate an institution willing to implement new technology in its regular English for Specific Purposes training programs curriculum. The sample for this study was selected from a flight training academy that was implementing the blended learning in its Aviation English training program. A total of 18 Chinese adult male flight students who were enrolled in the blended learning Aviation English training

program was the experimental group of this study. These 18 students were the second group of students in the institution to have the blended learning instructional method implemented in its Aviation English training program. The training program began its training during Spring, 2004 and the length of the intervention for this study was eight weeks of Aviation English instruction.

Sample Size

According to Gall et al. (1996), the sample size for large effect size with statistical power at level .5 with alpha = .05 is 15 for the correlation coefficient hypothesis test. The sample size for large effect size with statistical power at .5 with alpha = .05 for the related samples *t* test is 14 (p.190). Under the assumption that there were large differences in the test score gains between pretest and posttest scores of the students who were enrolled in the blended learning Aviation English training program, the sample size for this research design needed to be at least 18 participants. Therefore, a total number of 18 participants was sufficient for the above statistical analyses.

External Validity

The transferability of the findings of this pre-experimental one-group pretest-posttest design study may only be externally valid when the same type of Computer-Assisted Language Learning technology is implemented into a similar classroom setting for Aviation English training programs for students with similar characteristics of the participants. That is, the results of this study cannot be generalized to all the foreign students who are enrolled in the blended learning Aviation English training programs, as only a group of Chinese flight students are employed in this study. The results of this study could have higher external validity, when the same type of instruction method is

applied to the Chinese flight students who come to the United States to study for the Aviation English with characteristics similar to the participants in this study.

Sampling Plan

The sampling plan for this one-group pretest-posttest study was to select a class of foreign English languages learners who were studying the Aviation English with the implementation of blended learning in their ESP training program in the sate of Florida. Moreover, the selected sample took English proficiency pretests before the beginning of the training program and posttests after two months of intervention. The pretest and the posttest were the standardized tests that were included in the particular training program's regular curriculum and used by the instructor to measure the students' English learning performance.

In addition, a survey instrument was developed to distribute to all participants to collect students' background information, motivations, their attitudes toward learning ESP with online learning CALL technology, and their perceptions of CALL as facilitating interactions among students. The survey instrument was distributed to all the participants at the beginning and at the end of the intervention to observe students' attitudes changes. Both English and Chinese versions of the survey were available to all the participants in the experimental group. Participants of the survey had the choice of choosing to take either the English version or the Chinese version of the survey. The instruction to fill out the questionnaires was verbally delivered to all participants in both English and Chinese languages by the researcher to ensure the comprehensibility.

Recruitment

The procedures for recruiting participants was as follows: (1) identifying the ESP training programs that were implementing online learning CALL technology in classrooms lectures; (2) obtaining permissions from the institution and the instructor of the ESP training program (see Appendix B: Permission to Conduct the Study at the Participating Institution); and (3) statements of agreement were included on the cover page of the survey to obtain students' consent to participate in the study by signing their names and proceed to fill out the surveys.

Enhance Response Rates

The pretest and posttest scores on the AEPE tests were collected by the institution; therefore, the response rates and participant retention was not an issue for the study. On the other hand, the procedure to enhance the response rates for the surveys was explain to all students regarding the benefits and the risks of participating in the study in their primary language, and then, a request to students to voluntarily participate in the survey study.

Attrition Rate

The participants in this study were 18 male flight students coming from China. The anticipated attrition rate for this study was 0 to 8 percent. In the case that students dropped out from the study, the pretest and posttest scores of the particular students was to be omitted.

Strengths and Limitations of the Sampling Strategy

The strengths of the convenience sampling strategy for this study included: (1) the ability of narrowing down the intended target participants, (2) the benefits of

participating in this study would be interesting to participants and the instructor of the ESP training program which could increase the participation rates for this study, and (3) the convenience sampling was a strategy that was able to promote the institution's willingness to participate in this study in which the stakeholders had a vested interest in having a research study on the effectiveness of its training programs with no cost attached.

There were limitations of the convenience sampling strategy of the study. There were limited participants in the study and the results of the study cannot extrapolate to the whole population.

Data Collection

Methods of Data Collection

The pretest and posttest scores were collected via the Aviation English Placement Exam (AEPE) that was utilized by the participating institution to measure students' English performance. Furthermore, the pretest and posttest were included in the institution's regular curriculum. The instructor of the training program collected both pretest and posttest scores. The pretest was given to all the participants before the training program. The posttest was given after two months of intervention. The institution provided all the pretest and posttest data to the researcher.

A survey instrument was developed by the researcher to collect the data of students' background information including: educational levels, age, gender, amount of time of their interactions with native English-speakers, amount of time viewed TV and movies, amount of time communicated in English among themselves, years of prior computer experience, years of experience studying English, years of aviation training

experience, and their motivations for learning English. In addition, the survey also intended to collect students' perceptions of CALL technology as facilitating interactions among students and their attitudes toward learning English with CALL technology. The researcher was the only person to distribute and administer the survey. Confidentiality was ensured to all the participants. Students were asked to voluntarily participate in filling out the questionnaires. The survey was distributed to all participants before and after two months of intervention.

The participants were the second language learners whose primary language was Chinese. The survey instrument was developed in the Chinese language that was the participants' primary language. The questionnaires intended to collect students' age, gender, educational level, amount of time of students' interactions with native English-speakers, amount of time they communicated in English among themselves, years of prior experience in working with computers for language learning purposes, years of aviation training experience, years of experience studying English, amount of time viewing TV and movies, motivations for them to learn English, students' perceptions of CALL technology as facilitating interactions among students, and their attitudes toward learning ESP with CALL technology.

Pilot Test

A pilot test for the survey instrument was conducted to ensure the validity and reliability of the language that was used in the survey. In August 2003, twenty-six pilot test surveys were distributed to second language learners whose primary language was Chinese. Participants in the pilot testing indicated that statements in questionnaires were understandable and the translation was accurate. Moreover, most participants indicated

that the questionnaires correctly reflected their perceptions on learning English with CALL technology. Some of the participants expressed that they would like to have more in-depth questions on the CALL technology. The purpose of this study was to examine the effectiveness of implementing blended learning in ESP training program. Future studies should focus on the investigation of specific functions of the CALL systems. Adjustments and modifications were made after suggestions were collected through the pilot testing of the survey.

Data Analysis

SPSS software was employed to analyze the collected data. Descriptive statistical frequency analyses were performed to demonstrate trainees' responses to each item of the survey. Paired-samples *t* tests (George & Mallery, 2001, p. 122) were performed to examine if there was a significant difference between experimental group's pretest and posttest scores. One-way ANOVA analyses (George & Mallery, 2001, p. 132) were performed to analyze if a significant difference existed in the continuous variables between different groups. The above proposed statistical significance tests were at the .05 level of significance ($p < .05$); that is, the probability of the relationships occurring by chance is less than 5% (George & Mallery, 2001, p.114).

Descriptive statistical frequency analyses were performed to demonstrate trainees' responses to the each item of the survey instrument. Frequency tests were performed on all the variables to demonstrate the frequency counts, mean, maximum, minimum, and their distributions to see if these variables were normally distributed. A paired-samples *t* test was performed to test if significant difference existed between pre- and post test scores of students, who were enrolled in the blended learning English for Specific

Purposes (ESP) training. Paired-samples *t* tests were performed to test if significant differences existed between the pretest and the posttest listening comprehension, grammar, vocabulary, and reading comprehension scores of the participants.

Paired-samples *t* tests were performed to test if significant differences exist in students' attitudes toward learning ESP with CALL technology, their motivations for learning English, their perceptions of CALL as facilitating interactions among students, amount of time they interact with native English-speakers, amount of time they view TV and movies, and the amount of time they communicated in English among themselves before and after two months of intervention.

An analysis of variance (ANOVA) tests were performed to test if significant differences existed in students' attitudes toward learning English with CALL technology, students' perceptions of CALL technology as facilitating interactions among students, their motivations for study English, amount of time of students' interactions with native English-speakers, amount of time viewed TV an movies, amount of time they communicated in English among themselves, years of experience studying English, years of computer experience, years of aviation training experience, their ages, and their score gains between groups.

Bivariate correlation analyses were performed to test if correlations existed, the strength of the relationship, and the direction of the relationship between the variables of student's age, motivations for study English, attitudes toward learning English with CALL technology, perceptions of CALL as facilitating interactions among students, amount of their interactions with native English-speakers, amount of time viewing TV and movies, amount of time they communicated in English among themselves, years of

experience studying English, years of computer experience, years of aviation training experience, and students' score gains. The above proposed statistical significance tests were at the .05 level of significance ($p < .05$); that is, the probability of the relationships occurring by chance is less than 5% (George & Mallery, 2001, p.114).

Protective Measures

In case the assumptions of the chosen statistical models were violated, nonparametric statistical analyses were used. The assumed statistical models were violated when the variables were not normally distributed. The nonparametric tests were employed to analyze the not normally distributed variables.

Ethics

Research Goals

The goals of this research were to examine the effectiveness of implementing the instructional method of blended learning in ESP training programs, via evaluating students' pretest and posttest scores. The findings of the study can be beneficial to the ESOL learners in search for better training methods to learn English in specific classes within the educational institutions and companies that are offering the ESP training programs to students and employees. The findings of the study can also be beneficial to ESP instructors who are in a constant search for better and more effective instruction methods to teach English.

Risks and Benefits

The benefits and the risks of participating in this study were stated on the cover page of the survey and verbally communicated to all the participants in the Chinese language. There were no foreseeable risks for the participants from participating in this

study, because this was an assessment study. Moreover, there were no immediate benefits for the participants from participating in this study either. However, future students could benefit from the results of this study. The institution of the particular ESP training program might make changes to improve the program based on the results of this study.

Informed Consent

Survey instrument was developed in the both English and Chinese languages. Chinese was the participants' primary language. A cover page was attached to the survey instrument that indicated to the participants the risks and benefits of participating in the study. The informed consent was in the form of a paragraph included on the cover page. Participants gave their consents to participate in the study by signing their names and proceeded to fill out the surveys.

Confidentiality

A class session was held to distribute the survey. The instructor was not present during the session. The researcher administered the surveys. It took participants 12 to 15 minutes to complete the survey. Students were informed that the responses to the survey were voluntary and confidential; and only the researcher has the access to participants' responses to the survey. In addition, students' responses to the questionnaires were number coded. All the participants were informed of the above information in Chinese, which was their primary language.

Ownership of the Data

The ownership of participants' pretest and posttest scores on the AEPE is by the participating institution. The ownership of the survey data is by the researcher. No other

individual will have the access to the data. The researcher will store the data of the surveys securely for 5 years.

The only time that the researcher and the participants had contact was when the surveys were distributed to the participants. All the participants were informed in English and their primary language that participation in the survey study was solely voluntary (see Appendix C: IRB Approval Letter).

CHAPTER IV

RESULTS

The purpose of the current study was to examine the effectiveness of the implementation of online learning Computer-Assisted Language Learning (CALL) systems blended with an instructor (blended learning) in the English for Specific Purposes (ESP) training program. This chapter presents the results of the analysis of the data. The chapter begins with the description of the experimental group's characteristics, followed by the descriptive statistics of the variables, and the presentation of the results of statistical analyses used to answer each research question. This chapter also concludes with a brief summary of the findings for each research question presented.

A survey instrument was developed in English first and was subsequently translated into Chinese. The purpose of the survey was to collect data on students' basic background information regarding their age, gender, amount of they interact with native English-speakers, amount of time they view TV and movies, amount of time they communicate in English between themselves, years of computer experience, years of experience studying English, years of aviation training experience, and highest educational level. In addition, the survey also included items intended to identify students' attitudes toward learning English with CALL, motivations for studying English, and their perceptions of CALL technology in facilitating interactions among students, using 5-point Likert scale responses (i.e., 1, strongly disagree, to 5, strongly agree).

Ten items in the survey were intended to collect participants' motivations for studying English with 5-point Likert scale responses (i.e. 1, strongly disagree, to 5, strongly agree). Nine items of extrinsic motivations (instrumental and integrative) and

one item of intrinsic motivation for studying English were included in the survey. Instrumental motivations included in the survey were "to meet course requirements", "for definite future career", "to become a better educated person", "for possible future career", and "to gain respect from others". Integrative motivations included in the survey were "traveling", "meeting various English-speaking people", "interacting with North Americans while living in the United States", and "continuing the interactions with English-speaking North Americans in my home country". Intrinsic motivation included in the survey was "like language learning".

Presentation of Descriptive Characteristics of Participants

Description of the Participants

A group of 18 Chinese adult male flight students who were enrolled in the participating blended learning corporate Aviation English training program was selected as the pilot group of the one group pretest-posttest research design of this study. The 18 flight trainees were sent to the United States by their companies to study Aviation English and flight trainings. The length of the blended learning Aviation English training program was eight weeks. In addition, the blended learning of Computer-Assisted Language Learning (CALL) blended with an instructor was implemented in the particular training program.

Demographic Characteristics of the Participants

A summary of the descriptive statistics of the demographic information provided by the participants is presented in Table 1. All 18 Chinese adult participants were males, and the highest degree that the participants held was college degree. The youngest participant was 22 years old and the oldest participant was 27 years old. The mean age of

the participants was 25 years old. All the participants in the study had similar demographic characteristics.

Participants reported a varied amount of prior aviation training experience. Individuals in the study had been in the aviation training from 0 to 6 years. The average number of years of prior aviation training was 3.4 years. Only one participant had no prior aviation training experience. About 17% of the participants had 2 years of prior aviation training experience, and about 78% of the participants had 3 or more years of prior aviation training experience.

The participants of the current study also reported a varied amount of prior experience studying English. Participants in the study had been studying English from 2 to 12 years. The average number of years of prior experience studying English was 8.3 years. About 33% of the participants had 8 or fewer years of prior experience studying English; about 67% of the participants had 10 or more years of prior experience studying English.

Participants in the study reported that they had been working with computers for language learning purposes from 0 to 4 years. The average number of years of prior experience in working with computers for language learning purposes was 1.6 years. About 22 % of the participants had less than 1 year of prior experience in working with computers for language learning purposes; more than 55% of the participants had 1 to 2 years of prior experience in working with computers for language learning purposes. Moreover, about 22% of the participants had 3 or more years of prior experience in working with computers for language learning purposes.

Table 1

Demographics of the Participants

Variable	Mean	Min/Max	*SD*	Frequency	Percentage
Age	25.39	22 – 27	1.335	22 years = 2 25 years = 4 26 years = 11 27 years = 1	11.1 22.2 61.1 5.6
Gender				Male = 18	100
Education				College = 18	100
Aviation Training Experience	3.44	0 - 6	1.580	0 years = 1 2 years = 3 3 years = 8 5 years = 4 6 years = 2	5.6 16.7 44.4 22.2 11.1
Experience Studying English	8.28	2 - 12	3.006	2 years = 1 3 years = 1 4 years = 1 5 years = 2 8 years = 1 10 years = 11 12 years = 1	5.6 5.6 5.6 11.1 5.6 61.1 5.6
Work with Computer for Language Learning Purposes	1.639	0 - 4	1.198	0 years = 1 1/2 years = 3 1 years = 6 2 years = 4 3 years = 2 4 years = 2	5.6 16.7 33.3 22.2 11.1 11.1

Analyses of the Pretest-Posttest Scores

Descriptive statistics tests were performed to analyze participants' pretest and posttest scores on the Aviation English Placement Exam. The following section presents means and standard deviations of the pretest-posttest scores. Conclusions of the descriptive analyses are included in Chapter 5 of this study.

Descriptive Statistics of the Pretest Scores

A summary of the descriptive statistics of the results of the 18 participants' pretest scores on the Aviation English Placement Exam is presented in Table 3. An internal consistency estimate of reliability (coefficient alpha .897) indicated satisfactory reliability among the 100 items of the pretest Aviation English Placement Exam (AEPE). The AEPE consists of 40 items of listening, 20 items of grammar, 25 items of vocabulary, and 15 items of reading tests. As seen in Table 3, the mean pretest listening score was 22.22, which indicated that the participants had an average of more than 55% correct on the listening section. In addition, the mean pretest grammar score was 11.22, which indicated that the participants had an average of more than 56% correct on the grammar section. The mean pretest vocabulary score was 17.39, which indicated that the participants had average of 70% correct on the vocabulary section. Moreover, the mean pretest reading score was 7.56, which indicated that the participants had an average of 50% correct on the reading section. Finally, the mean pretest total score was 58.39%.

Descriptive Statistics of the Posttest Scores

A summary of the descriptive statistics of the results of the 18 participants' posttest scores on the Aviation English Placement Exam is presented in Table 3. An internal consistency estimate of reliability (coefficient alpha .875) indicated satisfactory reliability among the 100 items of the posttest Aviation English Placement Exam (AEPE). As seen in Table 3, the mean posttest listening score was 32.56, which indicated that the participants had an average of more than 81% correct on the listening section. The mean posttest grammar score was 13.72, which indicated that the participants had an average more than 68% correct on the grammar section. The mean posttest vocabulary

score was 21.22, which indicated that the participants had an average of 85% correct on the vocabulary section. The mean posttest reading score was 10.61, which indicated that the participants had an average of 71% correct on the reading section. Finally, the mean posttest total score was 78.11%.

Comparison of Pretest and Posttest Scores

Comparison of Pretest and Posttest Total Scores

Paired-samples *t* tests were utilized for the analysis of research Question 1.Paired-samples *t* tests compare two different means "based on groups of individuals who experience both conditions of the variables of interest" (George & Mallery, 2001, p.122). As seen in Table 2, the paired-samples *t* test analysis indicated that for the 18 subjects, there was a significant difference ($t = 6.973$, $p < .01$) between the posttest total scores ($M = 78.11$, $SD = 10.476$) and the pretest total scores ($M = 58.39$, $SD = 13.404$).

Table 2

Paired-Samples t Test: Comparison of Group on Pretest and Posttest Total Scores

Total Score	Mean	*SD*	*t*	df	Sig. (2-tailed)
Posttest - Pretest	19.72	11.999	6.973	17	.000

Table 3

Results of the Pretest-Posttest Scores: Means, Standard Deviations, and Mean Score Gains

AEPE Test Scores		Mean	Min/Max	*SD*	Mean Score Gain
Listening	Pretest	22.22	12 - 30	5.494	10.33
	Posttest	32.56	17 -38	4.805	
Grammar	Pretest	11.22	5 - 16	3.623	2.50
	Posttest	13.72	5 - 18	3.357	
Vocabulary	Pretest	17.39	12 - 24	3.898	3.83
	Posttest	21.22	16 - 25	2.734	
Reading	Pretest	7.56	2 - 12	3.110	3.06
	Posttest	10.61	3 - 15	3.071	
Total	Pretest	58.39	40 - 80	13.404	19.72
	Posttest	78.11	51 - 92	10.476	

Comparison of Test Scores on Four Components of AEPE

The posttest listening score was not normally distributed (Skewness = -2.158, Kurtosis = 6.043), the nonparametric test of Wilcoxon matched-pairs signed-ranks test was utilized to analyze the difference between the pretest listening and posttest listening scores. The nonparametric tests deal with the population that is not normally distributed and the Wilcoxon matched-pairs signed-ranks test incorporates information about the magnitude of the differences between paired values (George & Mallery, 2001). As seen in Table 5, there was a significant difference ($z = -3.762$, $p < .01$) between the pretest

listening scores ($M = 22.22$, $SD = 5.494$) and the posttest listening scores ($M = 32.56$, $SD = 4.805$).

Paired-samples t tests were utilized to analyze if there was a significant difference between participants' pretest-posttest grammar, vocabulary, and reading scores. As seen in Table 4, the results indicated that for the 18 subjects, there was a significant difference ($t = 2.919$, $p < .01$) between the posttest grammar scores ($M = 13.72$, $SD = 3.357$) and the pretest grammar scores ($M = 11.22$, $SD = 3.623$). Results indicated that there was a significant difference ($t = 4.600$, $p < .01$) between the posttest vocabulary scores ($M = 21.22$, $SD = 2.734$) and the pretest vocabulary scores ($M = 17.39$, $SD = 3.898$). The results also indicated that there was a significant difference ($t = 5.869$, $p < .01$) between the posttest reading scores ($M = 10.61$, $SD = 3.071$) the pretest reading scores ($M = 7.56$, $SD = 3.110$).

Table 4

Paired-Samples t Tests: Comparison on Pretest-Posttest Grammar, Vocabulary, and Reading Scores

AEPE	Mean	*SD*	*t*	*df*	Sig. (2-tailed)
Grammar	2.50	3.634	2.919	17	.010
Vocabulary	3.83	3.536	4.600	17	.000
Reading	3.06	2.209	5.869	17	.000

Table 5

Wilcoxon Matched-Pairs Signed-Ranks Test: Comparison on Pretest-Posttest Listening Scores

Listening	Mean Rank	Sum of Ranks	*z*	Sig. (2-tailed)
Pretest – Posttest	9.50	171.00	-3.762	.000

Correlation Analyses between Pretest-Posttest Scores

Additional Pearson correlation analysis was utilized to examine if significant correlation existed between the pretest-posttest total scores. As seen in Table 6, the results indicated that there was a significant positive correlation between the pretest and posttest total scores ($r = .518, p < .05$). Moreover, cross-examinations of correlations between pretest-posttest scores in the areas of listening, grammar, vocabulary, and reading were also performed. Conclusions of the results of the analyses are included in Chapter 5 of this study.

Correlation between the Pretest Scores

As seen in Table 6, the results indicated that a significant positive correlation existed between the pretest listening and pretest total scores ($r = .844, p < .01$). There was a significant positive correlation between the pretest grammar and pretest total scores ($r = .781, p < .01$). A significant positive correlation existed between the pretest vocabulary and pretest total scores ($r = .922, p < .01$). Moreover, the results also indicated that a significant positive correlation existed between the pretest reading and pretest total scores ($r = .754, p < .01$).

As seen in Table 6, the results indicated that a significant positive correlation existed between the pretest listening and pretest vocabulary scores ($r = .658, p < .01$). The results also indicated that a significant positive correlation existed between the pretest listening and pretest reading scores ($r = .553, p < .05$). There was no significant correlation between the pretest listening and pretest grammar scores ($r = .423, p = .080$). As seen in Table 7, results indicated that a significant positive correlation existed between the pretest grammar and pretest vocabulary scores ($r = .814, p < .01$). There was no significant correlation between the pretest grammar and pretest reading scores ($r = .432, p = .073$). In addition, a significant positive correlation existed between the pretest vocabulary and pretest reading scores ($r = .612, p < .01$).

Correlation between the Posttest Scores

As seen in Table 6, the results indicated that a significant positive correlation existed between the posttest listening and posttest total scores ($r_s = .622, p < .01$). There was a significant positive correlation between the posttest grammar and posttest total scores ($r = .550, p < .05$). There was a significant positive correlation between the posttest vocabulary and posttest total scores ($r = .870, p < .01$). Moreover, there was a significant positive correlation between the posttest reading and posttest total scores ($r = .786, p < .01$).

The posttest listening score was not normally distributed (Skewness = -2.158, Kurtosis = 6.043); therefore, Spearman rank correlation coefficients were utilized. The Spearman is to be used when the data are not normally distributed (George & Mallery, 2001, p. 116). The results indicated that there was no significant relationship between the posttest listening and posttest grammar scores ($r_s = .178, p = .479$). There was a

significant positive correlation between the posttest listening and posttest vocabulary scores ($r_s = .601, p < .01$). There was no significant relationship between the posttest listening and posttest reading scores ($r_s = .140, p = .579$). As seen in Table 7, the results indicated that there was no significant correlation between the posttest grammar and posttest vocabulary scores ($r = .411, p = .090$). In addition, there was no significant correlation between the posttest grammar and posttest reading scores ($r = .354, p = .149$). Moreover, there was a significant positive correlation between the posttest vocabulary and posttest reading scores ($r = .557, p < .05$).

Correlation between Pretest-Posttest Scores

The results indicated that there was no significant correlation between the posttest total scores and pretest listening scores ($r = .417, p = .086$). There was no significant correlation between the posttest total scores and pretest grammar scores ($r = .288, p = .247$). There was no significant correlation between posttest total scores and the pretest vocabulary scores ($r = .434, p = .072$). Moreover, there was a significant positive correlation between the posttest total scores and the pretest reading scores ($r = .617, p < .01$). In addition, there was no significant correlation between the posttest listening and pretest listening scores ($r_s = .313, p = .206$). There was no significant correlation between the posttest listening and pretest grammar scores ($r_s = -.165, p = .513$). There was no significant correlation between the posttest listening and pretest vocabulary scores ($r_s = -.084, p = .741$). There was no significant correlation between the posttest listening and pretest reading scores ($r_s = .182, p = .469$).

Furthermore, there was no significant correlation between posttest grammar and pretest grammar scores ($r = .460, p = .055$). There was no significant correlation between

the posttest grammar and pretest vocabulary scores ($r = .440$, $p = .067$). There was no significant correlation between posttest grammar and pretest reading scores ($r = .342$, $p = .164$). There was a significant positive correlation between the posttest vocabulary and pretest vocabulary scores ($r = .477$, $p < .05$). Finally, there was a significant positive correlation between the posttest reading and pretest reading scores ($r = .745$, $p < .01$).

Table 6

Pearson Correlation and Spearman Rank Correlation Coefficient (rho): Correlations between Posttest-Pretest Scores

		Total Score		Listening Score	
AEPE Test Scores		Posttest	Pretest	Posttest (rho)	Pretest
Listening	Posttest (rho)	.622**	.109		.334
	Sig. (2-tailed)	.006	.668		.176
	Pretest	.417	.844**	.313	
	Sig. (2-tailed)	.086	.000	.206	
Grammar	Posttest	.550*	.367	.178	.086
	Sig. (2-tailed)	.018	.134	.479	.733
	Pretest	.288	.781**	-.165	.423
	Sig. (2-tailed)	.247	.000	.513	.080
Vocabulary	Posttest	.870**	.508*	.601**	.408
	Sig. (2-tailed)	.000	.031	.008	.093
	Pretest	.434	.922**	-.084	.658**
	Sig. (2-tailed)	.072	.000	.741	.003
Reading	Posttest	.786**	.610**	.140	.441
	Sig. (2-tailed)	.000	.007	.579	.067
	Pretest	.617**	.754**	.182	.553*
	Sig. (2-tailed)	.006	.000	.469	.017
Total	Pretest	.518*			
	Sig. (2-tailed)	.028			

Note. *Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

Table 7

Pearson Correlation: Correlations between Pretest-Posttest Grammar, Vocabulary, and Reading Scores

AEPE Test Scores		Grammar		Vocabulary		Reading
		Posttest	Pretest	Posttest	Pretest	Posttest
Grammar	Posttest					
	Sig. (2-tailed)					
	Pretest	.460				
	Sig. (2-tailed)	.055				
Vocabulary	Posttest	.411	.357			
	Sig. (2-tailed)	.090	.146			
	Pretest	.440	.814**	.477*		
	Sig. (2-tailed)	.067	.000	.045		
Reading	Posttest	.354	.415	.557*	.495*	
	Sig. (2-tailed)	.149	.086	.016	.037	
	Pretest	.342	.432	.455	.612**	.745**
	Sig. (2-tailed)	.164	.073	.058	.007	.000

Note. *Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

Correlations between Demographics and Test Scores

Pearson correlation analyses were utilized to analyze if significant correlation existed between participants' demographics (years of aviation training, years of experience studying English, years in working with computers for language learning purposes), their pretest-posttest scores, and score gains. The data distribution of participants' ages (Skewness = -1.987, Kurtosis = 3.579) was not normally distributed; therefore, Spearman rank correlation coefficient analyses were utilized to analyze correlations between participant's ages, their test scores, and score gains.

As seen in Table 8, the results indicated that there was no significant correlation between participants' years of prior experience studying English and their pretest-posttest scores or score gains. There was no significant correlation between participants' prior years of experience in working with computers for language learning purposes and their pretest-posttest scores or score gains. On the other hand, results indicated that there was a significant positive correlation between participants' years of prior aviation training experience and their pretest reading scores ($r = .593, p < .01$).

In addition, there was a significant positive correlation between participants' years of prior aviation training experience and their posttest reading scores ($r = .486, p < .05$). As seen in Table 8, there was a significant positive correlation between participants' ages and their pretest reading scores ($r_s = .480, p < .05$). Moreover, the results indicated that there was no significant correlation between participants' ages and the score gains.

Table 8

Pearson Correlation and Spearman Rank Correlation Coefficient (rho): Correlations between Demographics and Test Scores

AEPE Test Scores		Aviation Training	Study English	Age (rho)	Work with Computer
Pretest	Listening	.245	.028	.139	.098
	Sig. (2-tailed)	.326	.912	.583	.699
	Grammar	.228	.178	.007	-.089
	Sig. (2-tailed)	.362	.481	.977	.726
	Vocabulary	.305	.191	.000	.032
	Sig. (2-tailed)	.219	.448	1.000	.900
	Reading	.593**	.228	.480*	.231
	Sig. (2-tailed)	.009	.363	.044	.357
	Total	.389	.168	.231	.079
	Sig. (2-tailed)	.111	.505	.357	.756
Posttest	Listening (rho)	.023	.348	.070	.137
	Sig. (2-tailed)	.928	.157	.784	.586
	Grammar	.036	-.225	.169	-.041
	Sig. (2-tailed)	.888	.369	.501	.872
	Vocabulary	.262	.400	.149	.107
	Sig. (2-tailed)	.294	.100	.554	.673
	Reading	.486*	.184	.449	.255
	Sig. (2-tailed)	.041	.464	.062	.306
	Total	.423	.212	.270	.196
	Sig. (2-tailed)	.080	.399	.278	.437
Score Gains	Listening	.127	.194	.109	.096
	Sig. (2-tailed)	.616	.439	.668	.705
	Grammar	-.195	-.385	.294	.051
	Sig. (2-tailed)	.439	.115	.236	.842
	Vocabulary	-.133	.099	.214	.047
	Sig. (2-tailed)	.598	.697	.393	.852
	Reading	-.159	-.064	-.020	.030
	Sig. (2-tailed)	.528	.799	.937	.905
	Total	-.064	-.003	.174	.083
	Sig. (2-tailed)	.799	.992	.490	.744

Note. *Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

Analyses of Variables

Descriptive statistics tests were performed to analyze the variables selected for participants' responses on the pre and post surveys. The following section presents means and standard deviations of the 18 participants' responses on the pre and post surveys. Conclusions are discussed in the Chapter 5 of the study concerning the results of the analyses.

Motivations

Motivation of Meet Course Requirement

Descriptive statistics of pre survey motivation of meet course requirement.

A summary of the descriptive statistics of the results of the 18 participants' pre survey responses on their motivations for the study of English is presented in Table 32. As seen in Table 32, the mean response to the pre survey motivation of "meet course requirements" was 3.11, and the standard deviation was 1.23, which indicated split responses to the statement before the beginning of the training program. That is, 50% of the participants indicated that they studied English because it was a course requirement (strongly agree and agree). On the other hand, nearly 45% of the participants reported that it was not a course requirement for them to study English (strongly disagree and disagree).

Descriptive statistics of post survey motivation of meet course requirement.

A summary of the descriptive statistics of the 18 participants' post survey responses to the motivations for the study of English is presented in Table 32. As seen in Table 32, the mean response to the post survey motivation of "meet course requirements" was 3.67, and the standard deviation was 1.24. After two months of blended learning,

61% of the participants indicated that they studied English because it was a course requirement (strongly agree and agree). On the other hand, nearly 28% of the participants responded that it was not a course requirement for them to study English (strongly disagree and disagree).

Correlations between pre survey motivation of meet course requirement and the test scores.

The data distribution of the pre survey motivation of "meet course requirement" was normally distributed (Skewness = -.022, Kurtosis = -1.412). Therefore, Pearson correlation analyses were utilized to examine if correlation existed between the pre survey motivation of "meet course requirement", the pretest-posttest scores, and the score gains. On the other hand, the posttest listening score was not normally distributed (Skewness = -2.158, Kurtosis = 6.043); therefore, Spearman rank correlation coefficient (rho) was utilized to analyze the correlations between the pre survey motivation of "meet course requirement", the posttest listening scores.

As seen in Table 9, there was no significant correlation between the pre survey motivation of "meet course requirement" and the pretest listening (r = -.047, p = .852), grammar (r = .021, p = .936), vocabulary (r = -.291, p = .241), reading (r = -.017, p = .946), or total (r = -.103, p = .686) scores. There was no significant correlation between the pre survey motivation of "meet course requirement" and the posttest listening (r_s = .081, p = .751), grammar (r = -.334, p = .176), vocabulary (r = -.340, p = .168), reading (r = -.003, p = .989), or total (r = -.174, p = .489) scores. In addition, there was no significant correlation between the pre survey motivation of "meet course requirement"

and the listening (r = .083, p = .744), grammar (r = -.329, p = .183), vocabulary (r = .059, p = .817), reading (r = .019, p = 940), or total (r = -.038, p = .882) score gains.

Correlations between post survey motivation of meet course requirement and the test scores.

The data distribution of the post survey motivation of "meet course requirement" was normally distributed (Skewness = -.327, Kurtosis = -1.534). Pearson correlation analyses were utilized to examine if correlation existed between the motivation of "meet course requirement", the posttest scores, and score gains. In addition, Spearman rank correlation coefficient analysis was utilized to examine if correlation existed between the post survey motivation of "meet course requirement" and the posttest listening scores.

As seen in Table 9, there was no significant correlation between the post survey motivation of "meet course requirement" and the posttest listening (r_s = .065, p = .798), grammar (r = -.293, p = .238), vocabulary (r = -.220, p = .380), reading (r = .088, p = .729), or total (r = -.038, p = .882) scores. The results indicated that there was no significant correlation between the post survey motivation of "meet course requirement" and the listening (r = .191, p = .447), grammar (r = -.209, p = .404), vocabulary (r = .094, p = .710), reading (r = -.014, p = .955), or total (r = .057, p = .823) score gains.

Motivation of Definite Future Career in Aviation

Descriptive statistics of pre survey motivation of definite future career in aviation.

The mean response to the pre survey motivation of "definite future career in aviation" was 3.56, and the standard deviation was 1.34, which indicated varied responses to the statement. More than half of the participants agreed that prior to the beginning of the training program studying English was for a definite future career in

aviation. Prior to the beginning of the training program, more than 55% of the participants reported that learning English was for a definite future career in aviation (strongly agree and agree). On the other hand, nearly 28% of the participants reported that learning English was not for a definite career in aviation, prior to the beginning of the training program (strongly disagree and disagree).

Descriptive statistics of post survey motivation of definite future career in aviation.

The mean response to the post survey motivation of "definite future career in aviation" was 3.61, and the standard deviation was 1.29. The majority of participants agreed that learning English was for a definite future career in aviation, after two months of the training program. More than 55% of the participants reported that learning English was for a definite future career in aviation (strongly agree and agree). On the other hand, 22% of the participants reported that learning English was not for a definite career in aviation (strongly disagree and disagree).

Correlations between pre survey motivation of definite future career in aviation and the test scores.

The data distribution of the pre survey motivation of "definite future career in aviation" was normally distributed (Skewness = -.382, Kurtosis = -1.191). Therefore, Pearson correlation analyses were utilized to examine if correlation existed between the pre survey motivation of "definite future career in aviation", the pretest-posttest scores, and score gains. Moreover, Spearman rank correlation coefficient (rho) was utilized to analyze the correlation between the pre survey motivation of "definite future career in aviation" and the posttest listening scores. As seen in Table 9, there was no significant

correlation between the pre survey motivation of "definite future career in aviation" and the pretest listening (r = -.178, p = .480), grammar (r = -.221, p = .378), vocabulary (r = -.416, p = .086), reading (r = -.093, p = .715), or total (r = -.275, p = .269) scores.

The results indicated that there was no significant correlation between the pre survey motivation of "definite future career in aviation" and the posttest listening (r_s = -.003, p = .992), grammar (r = -.239, p = .340), reading (r = -.130, p = .606), or total (r = -.244, p = .330) scores. On the other hand, there was a significant negative correlation between the pre survey motivation of "definite future career in aviation" and the posttest vocabulary scores (r = -.518, $p < .05$). Furthermore, there was no significant correlation between the pre survey motivation of "definite future career in aviation" and the listening (r = .174, p = .489), grammar (r = .000, p = 1.000), vocabulary (r = .058, p = .819), reading (r = -.051, p = .841), or total (r = .094, p = .709) score gains.

Correlations between post survey motivation of definite future career in aviation and the test scores.

The data distribution of the post survey motivation of "definite future career in aviation" was normally distributed (Skewness = -.461, Kurtosis = -.896). Therefore, Pearson correlation analyses were utilized to examine if correlation existed between the post survey motivation of "definite future career in aviation", the posttest scores, and score gains. A Spearman rank correlation coefficient analysis was utilized to examine the correlation between the post survey motivation of "definite future career in aviation" and the posttest listening scores.

As seen in Table 9, there was no significant correlation between the post survey motivation of "definite future career in aviation" and the posttest listening (r_s = .356, p =

.147), grammar (r = -.026, p = .917), vocabulary (r = .193, p = .444), reading (r = .019, p = .940), or total (r = .225, p = .368) scores. The results indicated that there was no significant correlation between the post survey motivation of "definite future career in aviation" and the listening (r = .033, p = .896), grammar (r = -.082, p = .748), vocabulary (r = .204, p = .416), reading (r = .029, p = .910), or total (r = .057, p = .822) score gains.

Table 9

Pearson Correlation and Spearman Rank Correlation Coefficient (rho): Correlations between Pre-Post Survey Motivations of Course Requirement, Definite Future Career, and the Test Scores

AEPE Test Scores		Pre Survey		Post Survey	
		Course Requirement	Definite Future Career	Course Requirement	Definite Future Career
Pretest	Listening	-.047	-.178		
	Sig. (2-tailed)	.852	.480		
	Grammar	.021	-.221		
	Sig. (2-tailed)	.936	.378		
	Vocabulary	-.291	-.416		
	Sig. (2-tailed)	.241	.086		
	Reading	-.017	-.093		
	Sig. (2-tailed)	.946	.715		
	Total	-.103	-.275		
	Sig. (2-tailed)	.686	.269		
Posttest	Listening (rho)	.081	-.003	.065	.356
	Sig. (2-tailed)	.751	.992	.798	.147
	Grammar	-.334	-.239	-.293	-.026
	Sig. (2-tailed)	.176	.340	.238	.917
	Vocabulary	-.340	-.518*	-.220	.193
	Sig. (2-tailed)	.168	.028	.380	.444
	Reading	-.003	-.130	.088	.019
	Sig. (2-tailed)	.989	.606	.729	.940
	Total	-.174	-.244	-.038	.225
	Sig. (2-tailed)	.489	.330	.882	.368
Score Gain	Listening	.083	.174	.191	.033
	Sig. (2-tailed)	.744	.489	.447	.896
	Grammar	-.329	.000	-.209	-.082
	Sig. (2-tailed)	.183	1.000	.404	.748
	Vocabulary	.059	.058	.094	.204
	Sig. (2-tailed)	.817	.819	.710	.416
	Reading	.019	-.051	-.014	.029
	Sig. (2-tailed)	.940	.841	.955	.910
	Total	-.038	.094	.057	.057
	Sig. (2-tailed)	.882	.709	.823	.822

Note. *Correlation is significant at the 0.05 level (2-tailed).

Comparison of groups' test scores in the pre-post survey motivations of meet course requirement.

Participants' responses to pre-post survey motivations of "meet course requirement" were aggregated and converted into two groups (disagree and agree); 1 (strongly disagree) and 2 (disagree) on the Likert scale were aggregated and converted into one group who disagreed with the pre-post survey statements; 4 (agree) and 5 (strongly agree) on the Likert scale were also aggregated and converted into another group who agreed with the statement. Analyses of variance (ANOVA) were utilized to analyze if there was a significant difference between the two groups on their pretest-posttest scores and score gains. "Analysis of variance is a procedure used for comparing sample means to see if there is sufficient evidence to infer that the means of the corresponding population distributions also differ" (George & Mallery, 2001, p. 132). In addition, the ANOVA procedure may have exactly one continuous dependent variable and one categorical independent variable (George & Mallery, p. 132).

As seen in Table 10, there was no significant difference between the two groups on their pretest listening ($F = .022, p = .884$), grammar ($F = .004, p = .953$), vocabulary ($F = 1.279, p = .276$), reading ($F = .024, p = .879$), or total ($F = .077, p = .785$) scores. There was no significant difference between the two groups on their posttest listening ($F = .081, p = .779$), grammar ($F = 2.284, p = .152$), vocabulary ($F = 1.934, p = .185$), reading ($F = .010, p = .922$), or total ($F = .925, p = .352$) scores. In addition, there was no significant difference between the two groups on their listening ($F = .000, p = .996$), grammar ($F = 2.181, p = .160$), vocabulary ($F = .070, p = .795$), reading ($F = .008, p = .931$), or total ($F = .116, p = .738$) score gains.

As seen in Table 11, the results of the ANOVA analyses on the post survey motivation of "meet course requirement" indicated that there was no significant difference between the two groups on their posttest listening ($F = .320, p = .580$), grammar ($F = 1.308, p = .272$), vocabulary ($F = 1.242, p = .284$), reading ($F = .616, p = .446$), or total ($F = .015, p = .905$) scores. Furthermore, there was no significant difference between the two groups on their listening ($F = .096, p = .761$), grammar ($F = 1.205, p = .291$), vocabulary ($F = .020, p = .891$), reading ($F = .195, p = .666$), or total ($F = .005, p = .944$) score gains.

Table 10

Analysis of Variance: Comparison of Disagreed (n = 8) and Agreed (n = 9) Groups in Pre Survey Motivation of Course Requirement on Test Scores

AEPE Test Scores	Group	Mean	*SD*	*F*	Sig.
Pretest					
Listening	Disagreed	22.38	5.476	.022	.884
	Agreed	22.18	5.718		
Grammar	Disagreed	11.00	4.209	.004	.953
	Agreed	11.11	3.371		
Vocabulary	Disagreed	18.63	4.689	1.279	.276
	Agreed	16.44	3.206		
Reading	Disagreed	8.00	3.665	.024	.879
	Agreed	7.78	2.167		
Total	Disagreed	60.00	17.238	.077	.785
	Agreed	58.11	10.277		
Posttest					
Listening	Disagreed	33.25	2.915	.081	.779
	Agreed	33.67	3.082		
Grammar	Disagreed	15.00	3.071	2.284	.152
	Agreed	12.56	3.539		
Vocabulary	Disagreed	22.38	2.825	1.934	.185
	Agreed	20.67	2.236		
Reading	Disagreed	11.13	2.900	.010	.922
	Agreed	11.00	2.236		
Total	Disagreed	81.75	7.611	.925	.352
	Agreed	77.89	8.796		
Score Gain					
Listening	Disagreed	10.88	5.515	.000	.996
	Agreed	10.89	6.133		
Grammar	Disagreed	4.00	4.440	2.181	.160
	Agreed	1.44	2.555		
Vocabulary	Disagreed	3.75	4.200	.070	.795
	Agreed	4.22	3.153		
Reading	Disagreed	3.13	1.642	.008	.931
	Agreed	3.22	2.728		
Total	Disagreed	21.75	13.802	.116	.738
	Agreed	19.78	10.010		

Table 11

Analysis of Variance: Comparison of Disagreed (n = 5) and Agreed (n = 11) Groups in Post Survey Motivation of Course Requirement on the Test Scores

AEPE Test Scores	Group	Mean	*SD*	*F*	Sig.
Posttest					
Listening	Disagreed	30.18	8.408	.320	.580
	Agreed	33.36	2.908		
Grammar	Disagreed	15.20	1.304	1.308	.272
	Agreed	13.09	3.961		
Vocabulary	Disagreed	22.60	3.209	1.242	.284
	Agreed	21.00	2.408		
Reading	Disagreed	9.60	4.506	.616	.446
	Agreed	11.00	2.683		
Total	Disagreed	79.20	15.897	.015	.905
	Agreed	78.45	8.971		
Score Gain					
Listening	Disagreed	9.20	7.190	.096	.761
	Agreed	10.27	6.608		
Grammar	Disagreed	3.60	4.775	1.205	.291
	Agreed	1.82	1.888		
Vocabulary	Disagreed	4.20	4.868	.020	.891
	Agreed	3.91	3.360		
Reading	Disagreed	2.40	2.074	.195	.666
	Agreed	2.91	2.166		
Total	Disagreed	19.40	18.078	.005	.944
	Agreed	18.91	9.894		

Comparison of groups' test scores in the pre-post survey motivations of definite future career in aviation.

Participants' responses to pre-post survey motivations of "definite future career in aviation" were aggregated and converted into two groups (disagree and agree); 1 (strongly disagree) and 2 (disagree) on the Likert scale were aggregated and converted into one group who disagreed with the pre-post survey statements; 4 (agree) and 5 (strongly agree) on the Likert scale were also aggregated and converted into another

group who agreed with the statement. Analyses of variance (ANOVA) were utilized to analyze if there was a significant difference between the two groups on their pretest-posttest scores and score gains.

As seen in Table 13, there was no significant difference between the two groups on their pretest listening ($F = 1.529, p = .238$) and grammar ($F = 2.679, p = .126$) scores. The results indicated that there was a significant difference between the disagreed group ($M = 21.60$, $SD = 2.793$) and the agreed group ($M = 16.20$, $SD = 3.120$) on the pretest vocabulary scores ($F = 10.636, p < .01$). There was a significant difference between the disagreed group ($M = 10.20$, $SD = 2.168$) and the agreed group ($M = 7.70$, $SD = 2.058$) on the pretest reading scores ($F = 4.760, p < .05$). There was also a significant difference between the disagreed group ($M = 71.00$, $SD = 10.700$) and the agreed group ($M = 56.40$, $SD = 11.098$) on the pretest total scores ($F = 5.897, p < .05$).

Moreover, there was no significant difference between the two groups on their posttest listening ($F = .000, p = 1.000$), grammar ($F = 3.045, p = .105$), reading ($F = 2.764, p = .120$), or total ($F = 3.987, p = .067$) scores. The results indicated that there was a significant difference between the disagreed group ($M = 23.60$, $SD = 1.673$) and the agreed group ($M = 20.30$, $SD = 2.406$) on the posttest vocabulary scores ($F = 7.455, p < .05$). In addition, there was no significant difference between the two groups on their listening ($F = 1.581, p = .231$), grammar ($F = .003, p = .956$), vocabulary ($F = 1.607, p = .227$), reading ($F = .282, p = .604$), or total ($F = 1.451, p = .250$) score gains.

As seen in Table 12, there was no significant difference between the two groups on their posttest listening ($F = 2.892, p = .115$), grammar ($F = .046, p = .834$), vocabulary ($F = .509, p = .489$), reading ($F = .125, p = .730$), or total ($F = .980, p = .342$) scores. In

addition, there was no significant difference between the two groups on their listening (F = .062, p = .808), grammar (F = .048, p = .830), vocabulary (F = .239, p = .634), reading (F = .000, p = 1.000), or total (F = .035, p = .854) score gains.

Table 12

Analysis of Variance: Comparison of Disagreed (n = 4) and Agreed (n = 10) Groups in Post Survey Motivation of Definite Future Career on the Test Scores

AEPE Test Scores	Group	Mean	*SD*	*F*	Sig.
Posttest					
Listening	Disagreed	28.75	8.261	2.892	.115
	Agreed	33.80	3.293		
Grammar	Disagreed	14.75	.957	.046	.834
	Agreed	14.40	3.134		
Vocabulary	Disagreed	20.25	3.775	.509	.489
	Agreed	21.50	2.635		
Reading	Disagreed	10.00	4.830	.125	.730
	Agreed	10.70	2.669		
Total	Disagreed	73.75	16.399	.980	.342
	Agreed	80.40	9.070		
Score Gain					
Listening	Disagreed	9.00	6.683	.062	.808
	Agreed	9.90	5.934		
Grammar	Disagreed	3.50	5.066	.048	.830
	Agreed	3.00	3.367		
Vocabulary	Disagreed	2.75	2.363	.239	.634
	Agreed	3.90	4.383		
Reading	Disagreed	3.00	1.826	.000	1.000
	Agreed	3.00	2.108		
Total	Disagreed	18.25	14.886	.035	.854
	Agreed	19.80	13.571		

Table 13

Analysis of Variance: Comparison of Disagreed (n = 5) and Agreed (n = 10) Groups in Pre Survey Motivation of Definite Future Career on the Test Scores

AEPE Test Scores	Group	Mean	*SD*	*F*	Sig.
Pretest					
Listening	Disagreed	25.60	3.782	1.529	.238
	Agreed	21.90	6.064		
Pretest Grammar	Disagreed	13.60	2.793	2.679	.126
	Agreed	10.60	3.565		
Pretest Vocabulary	Disagreed	21.60	2.793	10.636	.006**
	Agreed	16.20	3.120		
Pretest Reading	Disagreed	10.20	2.168	4.760	.048*
	Agreed	7.70	2.058		
Pretest Total	Disagreed	71.00	10.700	5.897	.030*
	Agreed	56.40	11.098		
Posttest					
Listening	Disagreed	33.20	2.168	.000	1.000
	Agreed	33.20	3.259		
Grammar	Disagreed	15.80	1.483	3.045	.105
	Agreed	12.90	3.510		
Vocabulary	Disagreed	23.60	1.673	7.455	.017*
	Agreed	20.30	2.406		
Reading	Disagreed	12.80	1.643	2.764	.120
	Agreed	11.00	2.108		
Total	Disagreed	85.40	3.715	3.987	.067
	Agreed	77.40	8.435		
Score Gain					
Listening	Disagreed	7.60	3.847	1.581	.231
	Agreed	11.30	5.926		
Grammar	Disagreed	2.20	2.280	.003	.956
	Agreed	2.30	3.622		
Vocabulary	Disagreed	2.00	3.082	1.607	.227
	Agreed	4.10	2.998		
Reading	Disagreed	2.60	1.949	.282	.604
	Agreed	3.30	2.584		
Total	Disagreed	14.40	9.555	1.451	.250
	Agreed	21.00	10.198		

Note. *Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

Motivation of Traveling

Descriptive statistics of pre survey motivation of traveling.

The mean response to the pre survey motivation of "traveling" was 2.5, and the standard deviation was 1.15. Prior to the beginning of the training program, nearly 44% of the participants reported that learning English was not for traveling (strongly disagree and disagree). Only 22% of the participants reported that learning English was for traveling (strongly agree and agree).

Descriptive statistics of post survey motivation of traveling.

The mean response to the post survey motivation of "traveling" was 2.83, and the standard deviation was .79. After two months of the training program, 33% of the participants reported that learning English was not for traveling (strongly disagree and disagree). Only 11% of the participants reported that learning English was for traveling (strongly agree and agree).

Correlations between pre survey motivation of traveling and the test scores.

The data distribution of the pre survey motivation of "traveling" was normally distributed (Skewness = -.130, Kurtosis = -1.405). Therefore, Pearson correlation analyses were utilized to examine if correlation existed between the pre survey motivation of "traveling", the pretest-posttest scores, and score gains. In addition, Spearman rank correlation coefficient (rho) was utilized to analyze the correlation statistics between the pre survey motivation of "traveling" and the posttest listening scores. As seen in Table 14, there was no significant correlation between the pre survey motivation of "traveling" and the pretest listening ($r = .382$, $p = .118$), grammar ($r = .169$,

$p = .502$), vocabulary ($r = .203, p = .418$), reading ($r = -.033, p = .897$), or total ($r = .254$, $p = .310$) scores.

The results indicated that there was no significant correlation between the pre survey motivation of "traveling" and the posttest listening ($r_s = -.131, p = .603$), grammar ($r = -.434, p = .072$), vocabulary ($r = -.280, p = .260$), reading ($r = -.275, p = .270$), or total ($r = -.376, p = .124$) scores. Furthermore, there was a significant negative correlation ($r = -.497, p < .05$) between the pre survey motivation of "traveling" and the listening score gains.

There was a significant negative correlation ($r = -.570, p < .05$) between the pre survey motivation of "traveling" and the grammar score gains. The results indicated that there was a significant negative correlation ($r = -.611, p < .01$) between the pre survey motivation of "traveling" and the total score gains. In addition, there was no significant correlation between the pre survey motivation of "traveling" and the vocabulary ($r = -.441, p = .067$), or reading ($r = -.336, p = .173$) score gains.

Correlations between post survey motivation of traveling and the test scores.

The data distribution of the post survey motivation of "traveling" was not normally distributed (Skewness = 1.163, Kurtosis = 2.274). Therefore, Spearman rank correlation coefficient analyses were utilized to examine if correlation existed between the post survey motivation of "traveling", the posttest scores, and score gains. As seen in Table 14, there was no significant correlation between the post survey motivation of "traveling" and the posttest listening ($r_s = .256, p = .305$), grammar ($r_s = -.087, p = .731$), vocabulary ($r_s = .085, p = .739$), reading ($r_s = -.164, p = .515$), or total ($r_s = -.056, p = .826$) scores. The results indicated that there was no significant correlation between the

post survey motivation of "traveling" and the listening (r_s = .186, p = .460), grammar (r_s = .156, p = .537), vocabulary (r_s = .184, p = .464), reading (r_s = .311, p = .208), or total (r_s = .245, p = .328) score gains.

Comparison of groups' test scores in the pre-post survey motivation of traveling.

Participants' responses to pre-post survey motivations of "traveling" were aggregated and converted into two groups (disagree and agree); 1 (strongly disagree) and 2 (disagree) on the Likert scale were aggregated and converted into one group who disagreed with the pre-post survey statements; 4 (agree) and 5 (strongly agree) on the Likert scale were also aggregated and converted into another group who agreed with the statements. Analyses of variance (ANOVA) were utilized to analyze if there was a significant difference between the two groups on their pretest-posttest scores and score gains.

As seen in Table 15, results of the ANOVA analyses of the pre survey motivation of "traveling" indicated that there was no significant difference between the two groups on their pretest listening (F = 1.572, p = .239), grammar (F = .253, p = .626), vocabulary (F = .300, p = .596), reading (F = .004, p = .948), or total (F = .561, p = .471) scores. In addition, there was no significant difference between the two groups on their posttest listening (F = .418, p = .533), grammar (F = 4.314, p = .065), vocabulary (F = .277, p = .610), reading (F = .667, p = .433), or total (F = 1.540, p = .243) scores. Moreover, there was no significant difference between the two groups on their listening (F = 2.477, p = .147), grammar (F = 2.842, p = .123), vocabulary (F = 1.104, p = .318), reading (F = .465, p = .511), or total (F = 3.188, p = .104) score gains.

Furthermore, as seen in Table 16, results of the ANOVA analyses of the post survey motivation of "traveling" indicated that there was no significant difference between the two groups on their posttest listening ($F = .303, p = .602$), grammar ($F = .514, p = .500$), vocabulary ($F = .017, p = .899$), reading ($F = .022, p = .887$), or total ($F = .020, p = .892$) scores. There was no significant difference between the two groups on their listening ($F = .211, p = .662$), grammar ($F = .180, p = .686$), vocabulary ($F = .008, p = .932$), reading ($F = 3.494, p = .111$), or total ($F = .228, p = .650$) score gains.

Motivation of Meet Various English-Speaking People

Descriptive statistics of pre survey motivation of meet various English-speaking people.

The mean response to the pre survey motivation of "meet various English-speaking people" was 3.56, and the standard deviation was 1.04, which indicated that the majority of the participants agreed that learning English was to meet various English-speaking people prior to the beginning of the training program. Prior to the beginning of the training program, 61% of the participants reported that learning English was to meet various English-speaking people (strongly agree and agree).Only 22% of the participants reported that learning English was not to meet various English-speaking people (strongly disagree and disagree).

Descriptive statistics of post survey motivation of meet various English-speaking people.

The mean response to the post survey motivation of "meet various English-speaking people" was 3.17, and the standard deviation was .99. After two months of the training program, nearly 45% of the participants reported that learning English was to

meet various English-speaking people (strongly agree and agree). However, 33% of the participants reported that learning English was not to meet various English-speaking people (strongly disagree and disagree).

Correlations between pre survey motivation of meet various English-speaking people and the test scores.

The data distribution of the pre survey motivation of "meet various English-speaking people" was normally distributed (Skewness = -.341, Kurtosis = -.972). Therefore, Pearson correlation analyses were utilized to examine if correlation existed between the pre survey motivation of "meet various English-speaking people", the pretest-posttest scores, and score gains. Spearman rank correlation coefficient (rho) was utilized to analyze the correlation between the pre survey motivation of "meet various English-speaking people" and the posttest listening scores.

As seen in Table 14, there was no significant correlation between the pre survey motivation of "meet various English-speaking people" and the pretest listening (r = -.064, p = .801), grammar (r = -.315, p = .203), vocabulary (r = -.201, p = .423), reading (r = -.264, p = .289), or total (r = -.231, p = .356) scores. The results indicated that there was no significant correlation between the pre survey motivation of "meet various English-speaking people" and the posttest listening (r_s = -.128, p = .613), grammar (r = -.307, p = .216), vocabulary (r = -.046, p = .857), reading (r = -.278, p = .264), or total (r = -.125, p = .622) scores. Furthermore, there was no significant correlation between the pre survey motivation of "meet various English-speaking people" and the listening (r = .177, p = .483), grammar (r = .031, p = .903), vocabulary (r = .186, p = .459), reading (r = -.014, p = .955), or total (r = .150, p = .554) score gains.

Correlations between post survey motivation of meet various English-speaking people and the test scores.

The data distribution of the post survey motivation of "meet various English-speaking people" was normally distributed (Skewness = .046, Kurtosis = -1.318). Pearson correlation analyses were utilized to examine if correlation existed between the post survey motivation of "meet various English-speaking people", the posttest scores, and score gains. In addition, a Spearman rank correlation coefficient analysis was performed to examine the correlation between the post survey motivation of "meet various English-speaking people" and the posttest listening scores.

As seen in Table 14, there was no significant correlation between the post survey motivation of "meet various English-speaking people" and the posttest listening (r_s = -.100, p = .692), grammar (r = -.252, p = .313), vocabulary (r = -.015, p = .954), reading (r = .062, p = .808), or total (r = -.008, p = .976) scores. There was no significant correlation between the post survey motivation of "meet various English-speaking people" and the listening (r = .030, p = .906), grammar (r = .140, p = .580), vocabulary (r = .177, p = .481), reading (r = .266, p = .286), or total (r = .158, p = .530) score gains.

Table 14

Pearson Correlation and Spearman Rank Correlation Coefficient (rho): Correlations between Pre-Post Survey Motivations of Traveling, Meet English-Speakers, and the Test Scores

AEPE Test Scores		Pre Survey		Post Survey	
		Traveling	Meet English-Speakers	Traveling (rho)	Meet English-Speakers
Pretest	Listening	.382	-.064		
	Sig. (2-tailed)	.118	.801		
	Grammar	.169	-.315		
	Sig. (2-tailed)	.502	.203		
	Vocabulary	.203	-.201		
	Sig. (2-tailed)	.418	.423		
	Reading	-.033	-.264		
	Sig. (2-tailed)	.897	.289		
	Total	.254	-.231		
	Sig. (2-tailed)	.310	.356		
Posttest	Listening (rho)	-.131	.128	.256	-.100
	Sig. (2-tailed)	.603	.613	.305	.692
	Grammar	-.434	-.307	-.087	-.252
	Sig. (2-tailed)	.072	.216	.731	.313
	Vocabulary	-.280	-.046	.085	-.015
	Sig. (2-tailed)	.260	.857	.739	.954
	Reading	-.275	-.278	-.164	.062
	Sig. (2-tailed)	.270	.264	.515	.808
	Total	-.376	-.125	-.056	-.008
	Sig. (2-tailed)	.124	.622	.826	.976
Score Gain	Listening	-.497*	.177	.186	.030
	Sig. (2-tailed)	.036	.483	.460	.906
	Grammar	-.570*	.031	.156	.140
	Sig. (2-tailed)	.014	.903	.537	.580
	Vocabulary	-.441	.186	.184	.177
	Sig. (2-tailed)	.067	.459	.464	.481
	Reading	-.336	-.014	.311	.266
	Sig. (2-tailed)	.173	.955	.208	.286
	Total	-.611**	.150	.245	.158
	Sig. (2-tailed)	.007	.554	.328	.530

Note. *Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

Table 15

Analysis of Variance: Comparison of Disagreed (n = 8) and Agreed (n = 4) Groups in Pre Survey Motivation of Traveling on Test Scores

AEPE Test Scores	Group	Mean	*SD*	*F*	Sig.
Pretest					
Listening	Disagreed	20.25	5.825	1.572	.239
	Agreed	24.50	4.796		
Grammar	Disagreed	11.13	4.121	.253	.626
	Agreed	12.25	2.217		
Vocabulary	Disagreed	17.25	4.464	.300	.596
	Agreed	18.75	4.500		
Reading	Disagreed	8.38	2.825	.004	.948
	Agreed	8.25	3.500		
Total	Disagreed	57.00	15.593	.561	.471
	Agreed	63.75	12.447		
Posttest					
Listening	Disagreed	33.63	3.159	.418	.533
	Agreed	32.25	4.113		
Grammar	Disagreed	15.50	1.852	4.314	.065
	Agreed	12.75	2.754		
Vocabulary	Disagreed	22.25	2.712	.277	.610
	Agreed	21.25	3.862		
Reading	Disagreed	11.75	2.866	.667	.433
	Agreed	10.50	1.291		
Total	Disagreed	83.13	6.686	1.540	.243
	Agreed	76.75	11.413		
Score Gain					
Listening	Disagreed	13.38	6.675	2.477	.147
	Agreed	7.75	3.096		
Grammar	Disagreed	4.38	4.173	2.842	.123
	Agreed	.50	2.517		
Vocabulary	Disagreed	5.00	4.567	1.104	.318
	Agreed	2.50	1.291		
Reading	Disagreed	3.38	2.387	.465	.511
	Agreed	2.25	3.304		
Total	Disagreed	26.13	14.157	3.188	.104
	Agreed	13.00	3.559		

Table 16

Analysis of Variance: Comparison of Disagreed (n = 6) and Agreed (n = 2) Groups in Post Survey Motivation of Traveling on Test Scores

AEPE Test Scores	Group	Mean	*SD*	*F*	Sig.
Posttest					
Listening	Disagreed	30.17	6.795	.303	.602
	Agreed	33.00	2.828		
Grammar	Disagreed	14.67	1.506	.514	.500
	Agreed	13.50	3.536		
Vocabulary	Disagreed	20.67	3.386	.017	.899
	Agreed	21.00	.000		
Reading	Disagreed	11.00	4.517	.022	.887
	Agreed	10.50	.707		
Total	Disagreed	76.50	14.039	.020	.892
	Agreed	78.00	5.657		
Score Gain					
Listening	Disagreed	9.33	7.789	.211	.662
	Agreed	12.00	.000		
Grammar	Disagreed	2.00	4.195	.180	.686
	Agreed	.50	4.950		
Vocabulary	Disagreed	2.33	2.503	.008	.932
	Agreed	2.50	.707		
Reading	Disagreed	2.33	2.066	3.494	.111
	Agreed	5.50	2.121		
Total	Disagreed	16.00	12.538	.228	.650
	Agreed	20.50	3.536		

Comparison of groups' test scores in the pre-post survey motivations of meet various English-speaking people.

Participants' responses to pre-post survey motivations of "meet various English-speaking people" were aggregated and converted into two groups (disagree and agree); 1 (strongly disagree) and 2 (disagree) on the Likert scale were aggregated and converted into one group who disagreed with the pre-post survey statements; 4 (agree) and 5 (strongly agree) on the Likert scale were also aggregated and converted into another

group who agreed with the statements. Analyses of variance (ANOVA) were utilized to analyze if there was a significant difference between the two groups on their pretest-posttest scores and score gains.

As seen in Table 17, results of the ANOVA analyses of the pre survey motivation of "meet various English-speaking people" indicated that there was no significant difference between the two groups on their pretest listening ($F = .023, p = .882$), grammar ($F = .948, p = .348$), vocabulary ($F = .233, p = .637$), reading ($F = .281, p = .605$), or total ($F = .355, p = .561$) scores. There was no significant difference between the two groups on their posttest listening ($F = .167, p = .690$), grammar ($F = 1.819, p = .200$), vocabulary ($F = .785, p = .392$), reading ($F = 1.101, p = .313$), or total ($F = 1.679, p = .218$) scores. In addition, there was no significant difference between the two groups on their listening ($F = .005, p = .943$), grammar ($F = .173, p = .684$), vocabulary ($F = .004, p = .950$), reading ($F = .175, p = .682$), or total ($F = .068, p = .798$) score gains.

Furthermore, as seen in Table 18, results of ANVOA analyses of the post survey motivation of "meet various English-speaking people" indicated that there was no significant difference between the two groups on their posttest listening ($F = .233, p = .638$), grammar ($F = 1.237, p = .288$), vocabulary ($F = .001, p = .978$), reading ($F = .017, p = .900$), or total ($F = .005, p = .947$) scores. There was no significant difference between the two groups on their listening ($F = .041, p = .844$), grammar ($F = .149, p = .706$), vocabulary ($F = .501, p = .493$), reading ($F = 1.288, p = .279$), or total ($F = .400, p = .539$) score gains.

Table 17

Analysis of Variance: Comparison of Disagreed (n = 4) and Agreed (n = 11) Groups in Pre Survey Motivation of Meet English-Speakers on Test Scores

AEPE Test Scores	Group	Mean	*SD*	*F*	Sig.
Pretest					
Listening	Disagreed	23.00	4.761	.023	.882
	Agreed	22.55	5.241		
Grammar	Disagreed	12.50	2.517	.948	.348
	Agreed	10.55	3.671		
Vocabulary	Disagreed	18.25	3.775	.233	.637
	Agreed	17.09	4.206		
Reading	Disagreed	8.50	1.291	.281	.605
	Agreed	7.55	3.446		
Total	Disagreed	62.25	10.751	.355	.561
	Agreed	57.73	13.595		
Posttest					
Listening	Disagreed	34.25	3.096	.167	.690
	Agreed	33.55	2.911		
Grammar	Disagreed	15.50	1.915	1.819	.200
	Agreed	12.73	3.875		
Vocabulary	Disagreed	22.75	1.258	.785	.392
	Agreed	21.45	2.770		
Reading	Disagreed	12.00	2.160	1.101	.313
	Agreed	10.45	2.622		
Total	Disagreed	84.50	5.196	1.679	.218
	Agreed	78.18	9.086		
Score Gain					
Listening	Disagreed	11.25	6.602	.005	.943
	Agreed	11.00	5.639		
Grammar	Disagreed	3.00	1.633	.173	.684
	Agreed	2.18	3.737		
Vocabulary	Disagreed	4.50	5.000	.004	.950
	Agreed	4.36	3.171		
Reading	Disagreed	3.50	3.109	.175	.682
	Agreed	2.91	2.166		
Total	Disagreed	22.25	14.818	.068	.798
	Agreed	20.45	10.671		

Table 18

Analysis of Variance: Comparison of Disagreed (n = 6) and Agreed (n = 8) Groups in Post Survey Motivation of Meet English-Speakers on the Test Scores

AEPE Test Scores	Group	Mean	*SD*	*F*	Sig.
Posttest					
Listening	Disagreed	32.00	7.430	.233	.638
	Agreed	33.38	2.875		
Grammar	Disagreed	14.38	1.602	1.237	.288
	Agreed	12.75	4.334		
Vocabulary	Disagreed	21.33	2.875	.001	.978
	Agreed	21.38	2.722		
Reading	Disagreed	10.50	4.324	.017	.900
	Agreed	10.75	2.964		
Total	Disagreed	78.67	14.720	.005	.947
	Agreed	78.25	8.190		
Score Gain					
Listening	Disagreed	10.67	8.477	.041	.844
	Agreed	11.38	4.627		
Grammar	Disagreed	2.00	2.000	.149	.706
	Agreed	2.88	5.222		
Vocabulary	Disagreed	3.33	4.033	.501	.493
	Agreed	4.75	3.454		
Reading	Disagreed	2.50	3.017	1.288	.279
	Agreed	3.88	1.458		
Total	Disagreed	18.50	14.433	.400	.539
	Agreed	22.88	11.519		

Motivation of Interact with North Americans while Living in the United States

Descriptive statistics of pre survey motivation of interact with North Americans while living in the United States.

The mean response to the pre survey motivation of "interact with North Americans while living in the United States" was 3.44, and the standard deviation was 1.34. Prior to the beginning of the training program, 61% of the participants reported that learning English was to interact with North Americans while living in the United States

(strongly agree and agree). Only 28% of the participants reported that learning English was not to interact with North Americans while living in the United States (strongly disagree and disagree).

Descriptive statistics of post survey motivation of interact with North Americans while living in the United States.

The mean response to the post survey motivation of "interact with North Americans while living in the Unite States" was 2.83, and the standard deviation was 1.25. After two months of the training program, 39% of the participants reported that learning English was to interact with North Americans while living in the Unite States (strongly agree and agree). However, 44% of the participants reported that learning English was not to interact with North Americans while living in the Unite States (strongly disagree and disagree).

Correlations between pre survey motivation of interact with North Americans while living in the United States and the test scores.

The data distribution of the pre survey motivation of "interact with North Americans while living in the Unite States" was normally distributed (Skewness = -.612, Kurtosis = -.773). Therefore, Pearson correlation analyses were utilized to examine if correlation existed between the pre survey motivation of "interact with North Americans while living in the Unite States", and the pretest-posttest scores, and score gains. Spearman rank correlation coefficient (rho) was utilized to analyze the correlation between the pre survey motivation of "interact with North Americans while living in the Unite States" and the posttest listening scores.

As seen in Table 19, there was no significant correlation between the pre survey motivation of "interact with North Americans while living in the Unite States" and the pretest listening ($r = .018, p = .944$), grammar ($r = .027, p = .915$), vocabulary ($r = .033, p = .898$), reading ($r = -.063, p = .804$), or total ($r = .009, p = .970$) scores. There was no significant correlation between the pre survey motivation of "interact with North Americans while living in the Unite States" and the posttest listening ($r_s = .027, p = .915$), grammar ($r = -.102, p = .688$), vocabulary ($r = .036, p = .888$), reading ($r = -.142, p = .575$), or total ($r = -.021, p = .936$) scores. There was no significant correlation between the pre survey motivation of "interact with North Americans while living in the Unite States" and the listening ($r = .061, p = .809$), grammar ($r = -.121, p = .633$), vocabulary ($r = -.008, p = .974$), reading ($r = -.108, p = .669$), or total ($r = -.028, p = .911$) score gains.

Correlations between post survey motivation of interact with North Americans while living in the Unite States and the test scores.

The data distribution of the post survey motivation of "interact with North Americans while living in the Unite States" was normally distributed (Skewness = -.057, Kurtosis = -1.216). Therefore, Pearson correlation analyses were utilized to examine if correlation existed between the post survey motivation of "interact with North Americans while living in the Unite States", the posttest scores, and score gains. A Spearman rank correlation coefficient analysis was performed to examine the correlation between the post survey motivation of "interact with North Americans while living in the Unite States" and the posttest listening scores.

As seen in Table 19, there was no significant correlation between the post survey motivation of "interact with North Americans while living in the Unite States" and the

posttest listening (r_s = .092, p = .716), grammar (r = .143, p = .572), vocabulary (r = .356, p = .147), reading (r = .258, p = .301), or total (r = .294, p = .237) scores. There was no significant correlation between the post survey motivation of "interact with North Americans while living in the Unite States" and the listening (r = -.276, p = .267), grammar (r = -.084, p = .740), vocabulary (r = .007, p = .979), reading (r = .004, p = .989), or total (r = -.160, p = .525) score gains.

Comparison of groups' test scores in pre-post survey motivations of interact with North Americans while living in the United States.

Participants' responses to pre-post survey motivations of "interact with North Americans while living in the Unite States" were aggregated and converted into two groups (disagree and agree); 1 (strongly disagree) and 2 (disagree) on the Likert scale were aggregated and converted into one group who disagreed with the pre-post survey statements; 4 (agree) and 5 (strongly agree) on the Likert scale were also aggregated and converted into another group who agreed with the statements. Analyses of variance (ANOVA) were utilized to analyze if there was a significant difference between the two groups on their pretest-posttest scores and score gains.

As seen in Table 20, results of the ANOVA analyses of the pre survey motivation of "interact with North Americans while living in the Unite States" indicated that there was no significant difference between the two groups on their pretest listening (F = .090, p = .769), grammar (F = .002, p = .966), vocabulary (F = .055, p = .818), reading (F = .559, p = .467), or total (F = .128, p = .725) scores. There was no significant difference between the two groups on their posttest listening (F = .000, p = .983), grammar (F = .106, p = .750), vocabulary (F = .003, p = .959), reading (F = 1.122, p = .307), or total (F

= .203, p = .659) scores. Furthermore, there was no significant difference between the two groups on their listening (F = .072, p = .792), grammar (F = .066, p = .801), vocabulary (F = .079, p = .783), reading (F = .076, p = .786), or total (F = .007, p = .934) score gains.

As seen in Table 21, results of the ANOVA analyses of the post survey motivation of "interact with North Americans while living in the Unite States" indicated that there was no significant difference between the two groups on their posttest listening (F = .859, p = .371), grammar (F = .904, p = .359), vocabulary (F = 3.182, p = .098), reading (F = 1.365, p = .264), or total (F = 2.498, p = .138) scores. In addition, there was no significant difference between the two groups on their listening (F = .351, p = .564), grammar (F = .000, p = .983), vocabulary (F = .003, p = .956), reading (F = .044, p = .838), or total (F = .124, p = .730) score gains.

Motivation of Become a Better Educated Person

Descriptive statistics of pre survey motivation of become a better educated person.

The mean response to the pre survey motivation of "become a better educated person" was 3.44, and the standard deviation was 1.34, which indicated that more than half of the respondents agreed that learning English was to become a better educated person prior to the beginning of the training program. Prior to the beginning of the training program, nearly 56% of the participants reported that learning English was to become a better educated person (strongly agree and agree). About 33% of the participants reported that learning English was not to become a better educated person, (strongly disagree and disagree).

Descriptive statistics of post survey motivation of become a better educated person.

The mean response to the post survey motivation of "become a better educated person" was 3.06, and the standard deviation was 1.211. After two months of the training program, nearly 39% of the participants reported that learning English was to become a better educated person (strongly agree and agree). About 33% of the participants reported that learning English was not to become a better educated person (strongly disagree and disagree).

Correlations between pre survey motivation of become a better educated person and the test scores.

The data distribution of the pre survey motivation of "become a better educated person" was normally distributed (Skewness = -.281, Kurtosis = -1.331). Therefore, Pearson correlation analyses were utilized to examine if correlation existed between the pre survey motivation of "become a better educated person", the pretest-posttest scores, and score gains. Spearman rank correlation coefficient (rho) was utilized to analyze the correlation between the pre survey motivation of "become a better educated person" and the posttest listening scores.

As seen in Table 19, there was no significant correlation between the pre survey motivation of "become a better educated person" and the pretest listening (r = .114, p = .653), grammar (r = .209, p = .405), vocabulary (r = .033, p = .898), reading (r = -.063, p = .804), or total (r = .098, p = .699) scores. There was no significant correlation between the pre survey motivation of "become a better educated person" and the posttest listening (r_s = -.324, p = .190), grammar (r = -.324, p = .189), vocabulary (r = -.286, p = .250),

reading (r = .145, p = .567), or total (r = -.205, p = .414) scores. In addition, there was a significant negative correlation (r = -.508, p < .05) between the pre survey motivation of "become a better educated person" and the grammar score gains. Furthermore, there was no significant correlation between the pre survey motivation of "become a better educated person" and the listening (r = -.226, p = .368), vocabulary (r = -.257, p = .303), reading (r = .290, p = .244), or total (r = -.289, p = .245) score gains.

Correlations between post survey motivation of become a better educated person and the test scores.

The data distribution of the post survey motivation of "become a better educated person" was normally distributed (Skewness = -.118, Kurtosis = -.761). Pearson correlation analyses were utilized to examine if correlation existed between the post survey motivation of "become a better educated person", the posttest scores, and score gains. In addition, a Spearman rank correlation coefficient analysis was performed to examine the correlation between the post survey motivation of "become a better educated person" and the posttest listening scores.

As seen in Table 19, there was no significant correlation between the post survey motivation of "become a better educated person" and the posttest listening (r_s = -.102, p = .688), grammar (r = .091, p = .720), vocabulary (r = -.093, p = .714), reading (r = .322, p = .192), or total (r = .120, p = .635) scores. There was no significant correlation between the post survey motivation of "become a better educated person" and the listening (r = .070, p = .781), grammar (r = .287, p = .248), vocabulary (r = .098, p = .698), reading (r = .285, p = .252), or total (r = .203, p = .418) score gains.

Table 19

Pearson Correlation and Spearman Correlation Coefficient (rho): Correlations between Pre-Post Survey Motivations of Interact with North Americans, Become a Better Educated Person, and Test Scores

AEPE Test Scores		Pre Survey		Post Survey	
		Interact with North Americans in the U.S.	Become Better Educated	Interact with North Americans in the U.S.	Become Better Educated
Pretest	Listening	.018	.114		
	Sig. (2-tailed)	.944	.653		
	Grammar	.027	.209		
	Sig. (2-tailed)	.915	.405		
	Vocabulary	.033	.033		
	Sig. (2-tailed)	.898	.898		
	Reading	-.063	-.063		
	Sig. (2-tailed)	.804	.804		
	Total	.009	.098		
	Sig. (2-tailed)	.970	.699		
Posttest	Listening (rho)	.027	-.324	.092	-.102
	Sig. (2-tailed)	.915	.190	.716	.688
	Grammar	-.102	-.324	.143	.091
	Sig. (2-tailed)	.688	.189	.572	.720
	Vocabulary	.036	-.286	.356	-.093
	Sig. (2-tailed)	.888	.250	.147	.714
	Reading	-.142	.145	.258	.322
	Sig. (2-tailed)	.575	.567	.301	.192
	Total	-.021	-.205	.294	.120
	Sig. (2-tailed)	.936	.414	.237	.635
Score Gain	Listening	.061	-.226	-.276	.070
	Sig. (2-tailed)	.809	.368	.267	.781
	Grammar	-.121	-.508*	-.084	.287
	Sig. (2-tailed)	.633	.031	.740	.248
	Vocabulary	-.008	-.257	.007	.098
	Sig. (2-tailed)	.974	.303	.979	.698
	Reading	-.108	.290	.004	.285
	Sig. (2-tailed)	.669	.244	.989	.252
	Total	-.028	-.289	-.160	.203
	Sig. (2-tailed)	.911	.245	.525	.418

Note. *Correlation is significant at the 0.05 level (2-tailed).

Table 20

Analysis of Variance: Comparison of Disagreed (n = 5) and Agreed (n = 11) Groups in Pre Survey Motivation of Interact with North Americans on the Test Scores

AEPE Test Scores	Group	Mean	*SD*	*F*	Sig.
Pretest					
Listening	Disagreed	22.80	6.458	.090	.769
	Agreed	21.91	5.088		
Grammar	Disagreed	11.00	5.148	.002	.966
	Agreed	10.91	3.239		
Vocabulary	Disagreed	17.40	5.128	.055	.818
	Agreed	16.91	3.239		
Reading	Disagreed	8.40	2.302	.559	.467
	Agreed	7.27	2.970		
Total	Disagreed	59.60	16.273	.128	.725
	Agreed	57.00	12.141		
Posttest					
Listening	Disagreed	33.40	3.647	.000	.983
	Agreed	33.36	2.838		
Grammar	Disagreed	14.00	5.148	.106	.750
	Agreed	13.36	2.803		
Vocabulary	Disagreed	21.20	2.950	.003	.959
	Agreed	21.27	2.453		
Reading	Disagreed	12.00	2.449	1.122	.307
	Agreed	10.55	2.583		
Total	Disagreed	80.60	9.423	.203	.659
	Agreed	78.55	8.029		
Score Gain					
Listening	Disagreed	10.60	6.269	.072	.792
	Agreed	11.45	5.733		
Grammar	Disagreed	3.00	4.301	.066	.801
	Agreed	2.45	3.778		
Vocabulary	Disagreed	3.80	4.764	.079	.783
	Agreed	4.36	3.202		
Reading	Disagreed	3.60	2.074	.076	.786
	Agreed	3.27	2.240		
Total	Disagreed	21.00	14.265	.007	.934
	Agreed	21.55	11.021		

Table 21

Analysis of Variance: Comparison of Disagreed (n = 8) and Agreed (n = 7) Groups in Post Survey Motivation of Interact with North Americans on the Test Scores

AEPE Test Scores	Group	Mean	*SD*	*F*	Sig.
Posttest					
Listening	Disagreed	31.38	6.255	.859	.371
	Agreed	33.71	2.430		
Posttest Grammar	Disagreed	12.88	3.643	.904	.359
	Agreed	14.57	3.207		
Posttest Vocabulary	Disagreed	20.38	2.504	3.182	.098
	Agreed	22.57	2.225		
Posttest Reading	Disagreed	9.88	3.227	1.365	.264
	Agreed	11.71	2.812		
Posttest Total	Disagreed	74.50	11.250	2.498	.138
	Agreed	82.57	7.955		
Score Gain					
Listening Gain	Disagreed	11.38	6.278	.351	.564
	Agreed	9.57	5.381		
Grammar Gain	Disagreed	2.25	4.132	.000	.983
	Agreed	2.29	1.704		
Vocabulary Gain	Disagreed	3.63	2.387	.003	.956
	Agreed	3.71	3.684		
Reading Gain	Disagreed	3.13	2.475	.044	.838
	Agreed	2.86	2.478		
Total Gain	Disagreed	20.38	10.623	.124	.730
	Agreed	18.43	10.706		

Comparison of groups' test scores in the pre-post survey motivations of become a better-educated person.

Participants' responses to pre-post survey motivations of "become a better educated person" were aggregated and converted into two groups (disagree and agree); 1 (strongly disagree) and 2 (disagree) on the Likert scale were aggregated and converted into one group who disagreed with the pre-post survey statements; 4 (agree) and 5 (strongly agree) on the Likert scale were also aggregated and converted into another

group who agreed with the statements. Analyses of variance (ANOVA) were utilized to analyze if there was a significant difference between the two groups on their pretest-posttest scores and score gains.

As seen in Table 22, results of the ANOVA analyses of the pre survey motivation of "become a better educated person" indicated that there was no significant difference between the two groups on their pretest listening ($F = .003, p = .960$), grammar ($F = .309, p = .587$), vocabulary ($F = .128, p = .726$), reading ($F = .622, p = .444$), or total ($F = .010, p = .920$) scores. There was no significant difference between the two groups on their posttest listening ($F = 1.213, p = .289$), grammar ($F = 1.870, p = .193$), vocabulary ($F = 1.739, p = .208$), reading ($F = .050, p = .826$), or total ($F = 1.740, p = .208$) scores. In addition, there was no significant difference between the two groups on their listening ($F = .477, p = .501$), grammar ($F = 3.834, p = .070$), vocabulary ($F = .268, p = .613$), reading ($F = 2.294, p = .152$), or total ($F = .631, p = .440$) score gains.

Furthermore, as seen in Table 23, results of the ANOVA analyses of the post survey motivation of "become a better educated person" indicated that there was no significant difference between the two groups on their posttest listening ($F = .344, p = .570$), grammar ($F = .014, p = .910$), vocabulary ($F = .002, p = .965$), reading ($F = 1.761, p = .211$), or total ($F = .407, p = .537$) scores. There was no significant difference between the two groups on their listening ($F = .297, p = .597$), grammar ($F = .218, p = .650$), vocabulary ($F = .647, p = .438$), reading ($F = 2.053, p = .180$), or total ($F = .758, p = .402$) score gains.

Table 22

Analysis of Variance: Comparison of Disagreed (n = 6) and Agreed (n = 10) Groups in Pre Survey Motivation of Become a Better Educated Person on the Test Scores

AEPE Test Scores	Group	Mean	*SD*	*F*	Sig.
Pretest					
Listening	Disagreed	23.17	6.369	.003	.960
	Agreed	23.30	4.084		
Grammar	Disagreed	10.50	4.135	.309	.587
	Agreed	11.60	3.658		
Vocabulary	Disagreed	18.17	4.792	.128	.726
	Agreed	17.40	3.748		
Reading	Disagreed	8.50	3.507	.622	.444
	Agreed	7.30	2.584		
Total	Disagreed	60.33	18.074	.010	.920
	Agreed	59.60	11.037		
Posttest					
Listening	Disagreed	34.50	3.017	1.213	.289
	Agreed	32.80	2.974		
Grammar	Disagreed	15.33	1.211	1.870	.193
	Agreed	12.90	4.202		
Vocabulary	Disagreed	22.67	2.875	1.739	.208
	Agreed	20.90	2.424		
Reading	Disagreed	11.00	2.366	.050	.826
	Agreed	11.30	2.710		
Total	Disagreed	83.50	5.612	1.740	.208
	Agreed	77.90	9.362		
Score Gain					
Listening	Disagreed	11.33	5.428	.477	.501
	Agreed	9.50	4.972		
Grammar	Disagreed	4.83	4.834	3.834	.070
	Agreed	1.30	2.452		
Vocabulary	Disagreed	4.50	4.135	.268	.613
	Agreed	3.50	3.504		
Reading	Disagreed	2.50	2.168	2.294	.152
	Agreed	4.00	1.764		
Total	Disagreed	23.17	15.184	.631	.440
	Agreed	18.30	9.534		

Table 23

Analysis of Variance: Comparison of Disagreed (n = 6) and Agreed (n = 7) Groups in Post Survey Motivation of Become a Better Educated Person on the Test Scores

AEPE Test Scores	Group	Mean	*SD*	*F*	Sig.
Posttest					
Listening	Disagreed	31.67	7.257	.344	.570
	Agreed	33.43	3.101		
Grammar	Disagreed	13.67	2.944	.014	.910
	Agreed	13.43	4.198		
Vocabulary	Disagreed	21.50	2.811	.002	.965
	Agreed	21.57	2.878		
Reading	Disagreed	9.00	3.464	1.761	.211
	Agreed	11.29	2.752		
Total	Disagreed	75.83	13.906	.407	.537
	Agreed	79.71	7.631		
Score Gain					
Listening	Disagreed	9.33	5.354	.297	.597
	Agreed	10.86	4.741		
Grammar	Disagreed	2.17	2.137	.218	.650
	Agreed	3.29	5.499		
Vocabulary	Disagreed	3.33	2.066	6.47	.438
	Agreed	4.71	3.729		
Reading	Disagreed	2.33	2.251	2.053	.180
	Agreed	3.86	1.574		
Total	Disagreed	17.17	10.147	.758	.402
	Agreed	22.71	12.433		

Motivation of Gain Respect from Others

Descriptive statistics of pre survey motivation of gain respect from others.

The mean response to the pre survey motivation of "gain respect from others" was 2.44, and the standard deviation was .92. Prior to the beginning of the training program, 50% of the participants reported that learning English was not to gain respect from others (strongly disagree and disagree). Only 11% of the participants reported that learning English was to gain respect from others (strongly agree and agree).

Descriptive statistics of post survey motivation of gain respect from others.

The mean response to the post survey motivation of "gain respect from others" was 2.28, and the standard deviation was .67. After two months of the training program, 61% of the participants reported that learning English was not to gain respect from others (strongly disagree and disagree). No participants (0%) reported that learning English was to gain respect from others (strongly agree and agree).

Correlations between pre survey motivation of gain respect from others and the test scores.

The data of the pre survey motivation of "gain respect from others" was normally distributed (Skewness = -.071, Kurtosis = -.632). Therefore, Pearson correlation analyses were utilized to examine if correlation existed between the pre survey motivation of "gain respect from others", the pretest-posttest scores, and score gains. Spearman rank correlation coefficient (rho) was utilized to analyze the correlation between the pre survey motivation of "gain respect from others" and the posttest listening scores.

As seen in Table 24, there was no significant correlation between the pre survey motivation of "gain respect from others" and the pretest listening ($r = .374, p = .126$), grammar ($r = .162, p = .520$), vocabulary ($r = .047, p = .852$), reading ($r = -.009, p = .971$), or total ($r = .209, p = .405$) scores. In addition, there was no significant correlation between the pre survey motivation of "gain respect from others" and the posttest listening ($r_s = -.238, p = .342$), grammar ($r = -.091, p = .720$), vocabulary ($r = -.158, p = .531$), reading ($r = -.018, p = .942$), or total ($r = -.188, p = .455$) scores. Moreover, there was a significant negative correlation ($r = -.542, p < .05$) between the pre survey motivation of "gain respect from others" and the listening score gain. There was no significant

correlation between the pre survey motivation of "gain respect from others" and the grammar (r = -.246, p = .325), vocabulary (r = -.174, p = .489), reading (r = -.013, p = .960), or total (r = -.398, p = .102) score gains.

Correlations between post survey motivation of gain respect from others and the test scores.

The data of the post survey motivation of "gain respect from others" was normally distributed (Skewness = -.382, Kurtosis = -.564). Therefore, Pearson correlation analyses were utilized to examine if correlation existed between the post survey motivation of "gain respect from others", the posttest scores, and score gains. A Spearman rank correlation coefficient analysis was performed to examine the correlation between the post survey motivation of "gain respect from others" and the posttest listening scores.

As seen in Table 24, there was no significant correlation between the post survey motivation of "gain respect from others" and the posttest listening (r_s = -.018, p = .944), grammar (r = .141, p = .576), vocabulary (r = .125, p = .621), reading (r = .457, p = .057), or total (r = .214, p = .395) scores. There was no significant correlation between the post survey motivation of "gain respect from others" and the listening (r = -.378, p = .122), grammar (r = -.085, p = .738), vocabulary (r = -.079, p = .756), reading (r = .347, p = .158), or total (r = -.173, p = .492) score gains.

Comparison of groups' test scores in the pre survey motivation of gain respect from others.

Participants' responses to pre survey motivation of "gain respect from others" were aggregated and converted into two groups (disagree and agree); 1 (strongly

disagree) and 2 (disagree) on the Likert scale were aggregated and converted into one group who disagreed with the pre survey statement; 4 (agree) and 5 (strongly agree) on the Likert scale were also aggregated and converted into another group who agreed with the statement. Analyses of variance (ANOVA) were utilized to analyze if there was a significant difference between the two groups on their pretest-posttest scores and score gains.

As seen in Table 25, there was no significant difference between the two groups on their pretest listening ($F = .295, p = .600$), grammar ($F = .153, p = .705$), vocabulary ($F = .004, p = .951$), reading scores ($F = .002, p = .965$), or total ($F = .113, p = .744$) scores. The results indicated that there was a significant difference ($F = 7.553, p < .05$) between the disagreed group ($M = 34.11$, $SD = 2.667$) and the agreed group ($M = 28.50$, $SD = 2.121$) on the posttest listening scores. There was no significant difference between the two groups on their posttest grammar ($F = .071, p = .796$), vocabulary ($F = 2.887, p = .124$), reading ($F = .193, p = .671$), or total ($F = 3.558, p = .092$) scores. In addition, there was no significant difference between the two groups on their listening ($F = 3.985, p = .077$), grammar ($F = .238, p = .637$), vocabulary ($F = 1.888, p = .203$), reading ($F = .155, p = .703$), or total ($F = 2.452, p = .152$) score gains.

Comparison of groups' test scores in the post survey motivation of gain respect from others.

Participants' responses to post survey motivation of "gain respect from others" were aggregated and converted into two groups (disagree and agree). The study attempted to aggregate and convert the responses of 1 (strongly disagree) and 2 (disagree) on the Likert scale into one group who disagreed with the statement; 4 (agree) and 5

(strongly agree) on the Likert scale into another group who agreed with the statement. However, the result of the conversions was not successful, in which no single participant agreed that learning English was to gain respect from others. Therefore, the Analysis of variance (ANOVA) analysis was not performed.

Motivation of Possible Future Career

Descriptive statistics of pre survey motivation of possible future career.

The mean response to the pre survey motivation of "possible future career" was 3.94, and the standard deviation was 1.06, which indicated that the majority of respondents agreed that prior to the beginning of the training program learning English was for a possible future career. Prior to the beginning of the training program, more than 77% of the participants reported that learning English was for possible career (strongly agree and agree). Only about 17% of the participants reported that learning English was not for possible future career (strongly disagree and disagree).

Descriptive statistics of post survey motivation of possible future career.

The mean response to the post survey motivation of "possible future career" was 4.06, and the standard deviation was .80. After two months of training program, more than 83% of the participants reported that learning English was for a possible future career (strongly agree and agree). In addition, only about 6% of the participants reported that learning English was not for a possible future career (strongly disagree and disagree).

Correlations between pre survey motivation of possible future career and the test scores.

The data of the pre survey motivation of "possible future career" was normally distributed (Skewness = -.891, Kurtosis = -.161). Therefore, Pearson correlation analyses

were utilized to examine if correlation existed between the pre survey motivation of "possible future career", the pretest-posttest scores, and score gains. Spearman rank correlation coefficient (rho) was utilized to analyze the correlation between the pre survey motivation of "possible future career" and the posttest listening scores.

As seen in Table 24, there was no significant correlation between the pre survey motivation of "possible future career" and the pretest listening (r = -.038, p = .880), grammar (r = -.366, p = .136), vocabulary (r = -.223, p = .373), reading (r = .028, p = .913), or total (r = -.173, p = .492) scores. There was no significant correlation between the pre survey motivation of "possible future career" and the posttest listening (r_s = .290, p = .243), grammar (r = .145, p = .567), vocabulary (r = -.097, p = .701), reading (r = .029, p = .908), or total (r = .155, p = .540) scores.

Furthermore, there was no significant correlation between the pre survey motivation of "possible future career" and the listening (r = .255, p = .307), vocabulary (r = .171, p = .498), reading (r = .001, p = .996), or total (r = .328, p = .183) score gains. In addition, there was a significant positive correlation (r = .498, $p < .05$) between the pre survey motivation of "possible future career" and the grammar score gains.

Correlations between post survey motivation of possible future career and the test scores.

The data distribution of the post survey motivation of "possible future career" was normally distributed (Skewness = -.875, Kurtosis = 1.305). Pearson correlation analyses were utilized to examine if correlation existed between the post survey motivation of "possible future career", the posttest scores, and score gains. In addition, a Spearman

rank correlation coefficient analysis was performed to examine the correlation between the post survey motivation of "possible future career" and the posttest listening scores.

As seen in Table 24, there was no significant correlation between the post survey motivation of "possible future career" and the posttest listening (r_s = .279, p = .263), grammar (r = .421, p = .082), vocabulary (r = .316, p = .202), reading (r = .367, p = .134), or total (r = .433, p = .073) scores. There was no significant correlation between the post survey motivation of "possible future career" and the listening (r = -.139, p = .582), grammar (r = .232, p = .354), vocabulary (r = .066, p = .796), reading (r = .131, p = .605), or total (r = .044, p = .861) score gains.

Table 24

Pearson Correlation and Spearman Rank Correlation Coefficient: Correlations between Pre-Post Survey Motivations of Gain Respect from Others, Possible Future Career, and the Test Scores

AEPE Test Scores		Pre Survey		Post Survey	
		Gain Respect	Possible Future Career	Gain Respect	Possible Future Career
Pretest					
	Listening	.374	-.038		
	Sig. (2-tailed)	.126	.880		
	Grammar	.162	-.366		
	Sig. (2-tailed)	.520	.136		
	Vocabulary	.047	-.223		
	Sig. (2-tailed)	.852	.373		
	Reading	-.009	.028		
	Sig. (2-tailed)	.971	.913		
	Total	.209	-.173		
	Sig. (2-tailed)	.405	.492		
Posttest					
	Listening (rho)	-.238	.290	-.018	.279
	Sig. (2-tailed)	.342	.243	.944	.263
	Grammar	-.091	.145	.141	.421
	Sig. (2-tailed)	.720	.567	.576	.082
	Vocabulary	-.158	-.097	.125	.316
	Sig. (2-tailed)	.531	.701	.621	.202
	Reading	-.018	.029	.457	.367
	Sig. (2-tailed)	.942	.908	.057	.134
	Total	-.188	.155	.214	.433
	Sig. (2-tailed)	.455	.540	.395	.073
Score Gain					
	Listening	-.542*	.255	-.378	-.139
	Sig. (2-tailed)	.020	.307	.122	.582
	Grammar	-.246	.498*	-.085	.232
	Sig. (2-tailed)	.325	.035	.738	.354
	Vocabulary	-.174	.171	-.079	.066
	Sig. (2-tailed)	.489	.498	.756	.796
	Reading	-.013	.001	.347	.131
	Sig. (2-tailed)	.960	.996	.158	.605
	Total	-.398	.328	-.173	.044
	Sig. (2-tailed)	.102	.183	.492	.861

Note. *Correlation is significant at the 0.05 level (2-tailed).

Table 25

Analysis of Variance: Comparison of Disagreed (n = 9) and Agreed (n = 2) Groups in Pre Survey Motivation of Gain Respect from Others on Test Scores

AEPE Test Scores	Group	Mean	*SD*	*F*	Sig.
Pretest					
Listening	Disagreed	21.44	6.307	.295	.600
	Agreed	24.00	2.828		
Grammar	Disagreed	10.89	3.551	.153	.705
	Agreed	12.00	4.243		
Vocabulary	Disagreed	17.78	4.055	.004	.951
	Agreed	18.00	7.071		
Reading	Disagreed	7.89	3.296	.002	.965
	Agreed	8.00	1.414		
Total	Disagreed	58.00	15.166	.113	.744
	Agreed	62.00	15.556		
Posttest					
Listening	Disagreed	34.11	2.667	7.553	.023*
	Agreed	28.50	2.121		
Grammar	Disagreed	14.56	2.007	.071	.796
	Agreed	14.00	5.657		
Vocabulary	Disagreed	22.00	2.500	2.887	.124
	Agreed	18.50	3.536		
Reading	Disagreed	10.67	2.000	.193	.671
	Agreed	10.00	1.414		
Total	Disagreed	81.33	5.916	3.558	.092
	Agreed	71.00	12.728		
Score Gain					
Listening	Disagreed	12.67	5.545	3.985	.077
	Agreed	4.50	.707		
Grammar	Disagreed	3.67	4.610	.238	.637
	Agreed	2.00	1.414		
Vocabulary	Disagreed	4.22	3.456	1.888	.203
	Agreed	.50	3.536		
Reading	Disagreed	2.78	2.682	.155	.703
	Agreed	2.00	.000		
Total	Disagreed	23.33	12.379	2.452	.152
	Agreed	9.00	2.828		

Note. *Correlation is significant at the 0.05 level (2-tailed)

Comparison of groups' test scores in the pre survey motivation of possible future career.

Participants' responses to pre survey motivation of "possible future career" were aggregated and converted into two groups (disagree and agree); 1 (strongly disagree) and 2 (disagree) on the Likert scale were aggregated and converted into one group who disagreed with the statement; 4 (agree) and 5 (strongly agree) on the Likert scale were also aggregated and converted into another group who agreed with the statement. Analyses of variance (ANOVA) were utilized to analyze if there was a significant difference between the two groups on their pretest-posttest scores and score gains.

As seen in Table 26, there was no significant difference between the two groups on their pretest listening ($F = .234, p = .635$), vocabulary ($F = 3.228, p = .093$), reading ($F = .537, p = .475$), or total ($F = 2.121, p = .166$) scores. The results indicated that there was a significant difference ($F = 5.360, p < .05$) between the disagreed group ($M = 15.00$, $SD = 1.000$) and the agreed group ($M = 10.21$, $SD = 3.468$) on the pretest grammar scores. In addition, there was no significant difference between the two groups on their posttest listening ($F = .264, p = .615$), grammar ($F = .025, p = .877$), vocabulary ($F = 1.983, p = .179$), reading ($F = 3.529, p = .080$), or total ($F = .692, p = .419$) scores. Furthermore, there was no significant difference between the two groups on their listening ($F = .541, p = .473$), grammar ($F = 4.290, p = .056$), vocabulary ($F = .783, p = .390$), reading ($F = .994, p = .335$), or total ($F = 1.108, p = .309$) score gains.

Comparison of groups' test scores in the post survey motivation of possible future career.

Participants' responses to the post survey motivation of "possible future career" were converted into two groups (disagree and agree). The study attempted to aggregate and convert the responses of 1 (strongly disagree) and 2 (disagree) on the Likert scale into one group who disagreed with the statement; 4 (agree) and 5 (strongly agree) on the Likert scale into another group who agreed with the statement. However, the result of the conversions was not successful, in that there was only 1 participant converted into the disagreed group and 15 participants were converted into the agreed group. Therefore, the Analysis of Variance (ANOVA) analysis was not performed.

Table 26

Analysis of Variance: Comparison of Disagreed (n = 3) and Agreed (n = 14) Groups in Pre Survey Motivation of Possible Future Career on the Test Scores

AEPE Test Scores	Group	Mean	*SD*	*F*	Sig.
Pretest					
Listening	Disagreed	24.00	5.000	.234	.635
	Agreed	22.29	5.649		
Grammar	Disagreed	15.00	1.000	5.360	.035*
	Agreed	10.21	3.468		
Vocabulary	Disagreed	21.00	2.000	3.228	.093
	Agreed	16.71	3.950		
Reading	Disagreed	9.00	4.359	.537	.475
	Agreed	7.64	2.620		
Total	Disagreed	69.00	12.124	2.121	.166
	Agreed	56.86	13.248		
Posttest					
Listening	Disagreed	32.67	2.082	.264	.615
	Agreed	33.64	3.104		
Grammar	Disagreed	14.00	2.646	.025	.877
	Agreed	13.64	3.692		
Vocabulary	Disagreed	23.33	2.082	1.983	.179
	Agreed	21.07	2.586		
Reading	Disagreed	13.33	2.082	3.529	.080
	Agreed	10.57	2.344		
Total	Disagreed	83.33	8.083	.692	.419
	Agreed	78.93	8.362		
Score Gain					
Listening	Disagreed	8.67	3.055	.541	.473
	Agreed	11.36	6.059		
Grammar	Disagreed	-1.00	2.000	4.290	.056
	Agreed	3.43	3.524		
Vocabulary	Disagreed	2.33	1.528	.783	.390
	Agreed	4.36	3.815		
Reading	Disagreed	4.33	2.517	.994	.335
	Agreed	2.93	2.165		
Total	Disagreed	14.33	5.508	1.108	.309
	Agreed	22.07	12.225		

Note. *Correlation is significant at the 0.05 level (2-tailed)

Motivation of Like Language Learning

Descriptive statistics of pre survey motivation of like language learning.

The mean response to the pre survey motivation of "like language learning" was 3.39, and the standard deviation was 1.24, which indicated varied responses to the statement. Prior to the beginning of the training program, more than half of the participants (56%) reported that learning English was because they liked language learning (strongly agree and agree). Only 22% of the participants reported that their motivation for learning English was not because they liked language learning (strongly disagree and disagree).

Descriptive statistics of post survey motivation of like language learning.

The mean response to the post survey motivation of "like language learning" was 3, and the standard deviation was 1.14. After two months of the training program, about 28% of the participants reported that learning English was because they liked language learning (strongly agree and agree). In addition, about 28% of the participants reported that learning English was not because they liked language learning (strongly disagree and disagree).

Correlations between pre survey motivation of like language learning and the test scores.

The data distribution of the pre survey motivation of "like language learning" was normally distributed (Skewness = -.644, Kurtosis = -.320). Therefore, Pearson correlation analyses were utilized to examine if correlation existed between the pre survey motivation of "like language learning", the pretest-posttest scores, and score gains. Spearman rank correlation coefficient (rho) was utilized to analyze the correlation

between the pre survey motivation of "like language learning" and the posttest listening scores.

As seen in Table 27, there was a significant positive correlation between the motivation of "like language learning" and the pretest listening scores ($r = .581, p < .05$). Results indicated that there was no significant correlation between the pre survey motivation of "like language learning" and the pretest grammar ($r = .097, p = .701$), vocabulary ($r = .283, p = .256$), reading ($r = .002, p = .995$), or total ($r = .347, p = .158$) scores.

There was no significant correlation between the pre survey motivation of "like language learning" and the posttest listening ($r_s = .018, p = .944$), grammar ($r = -.269, p = .281$), vocabulary ($r = .233, p = .353$), reading ($r = .027, p = .917$), or total ($r = .024, p = .926$) scores. In addition, there was no significant correlation between the pre survey motivation of "like language learning" and the listening ($r = -.462, p = .053$), grammar ($r = -.345, p = .161$), vocabulary ($r = -.132, p = .603$), reading ($r = .035, p = .892$), or total ($r = -.367, p = .134$) score gains.

Correlations between post survey motivation of like language learning and the test scores.

The data distribution of the post survey motivation of "like language learning" was normally distributed (Skewness = .000, Kurtosis = -.109). Therefore, Pearson correlation analyses were utilized to examine if correlation existed between the post survey motivation of "like language learning", the posttest scores, and score gains. A Spearman rank correlation coefficient analysis was performed to examine the correlation

between the post survey motivation of "like language learning" and the posttest listening scores.

As seen in Table 27, there was no significant correlation between the post survey motivation of "like language learning" and the posttest listening (r_s = -.116, p = .648), grammar (r = .185, p = .463), vocabulary (r = .095, p = .709), reading (r = .269, p = .280), or total (r = .133, p = .598) scores. In addition, there was no significant correlation between the post survey motivation of "like language learning" and the grammar (r = -.157, p = .535), vocabulary (r = -.351, p = .153), reading (r = .140, p = .578), or total (r = -.366, p = .135) score gains. Moreover, there was a significant negative correlation between the post survey motivation of "like language learning" and the listening score gains (r = -.485, p < .041).

Comparison of groups' test scores in the pre-post survey motivations of like language learning.

Participants' responses to pre-post survey motivations of "like language learning" were aggregated and converted into two groups (disagree and agree); 1 (strongly disagree) and 2 (disagree) on the Likert scale were aggregated and converted into one group who disagreed with the pre-post survey statements; 4 (agree) and 5 (strongly agree) on the Likert scale were also aggregated and converted into another group who agreed with the statements. Analyses of variance (ANOVA) were utilized to analyze if there was a significant difference between the two groups on their pretest-posttest scores and score gains.

As seen in Table 29, results of the ANOVA analyses of the pre survey motivation of "like language learning" indicated that there was no significant difference between the

two groups on their pretest grammar ($F = .222, p = .646$), vocabulary ($F = 1.360, p = .266$), reading ($F = .001, p = .980$), or total ($F = 2.035, p = .179$) scores. There was a significant difference ($F = 7.550, p < .05$) between the disagreed group ($M = 16.75$, $SD = 4.856$) and the agreed group ($M = 24.30$, $SD = 4.572$) on the pretest listening scores. There was no significant difference between the two groups on their posttest listening ($F = .036, p = .853$), grammar ($F = 1.162, p = .302$), vocabulary ($F = .417, p = .530$), reading ($F = .022, p = .884$), or total ($F = .105, p = .751$) scores. In addition, there was a significant difference ($F = 8.017, p < .05$) between the disagreed group ($M = 17.00$, $SD = 4.397$) and the agreed group ($M = 9.10$, $SD = 4.818$) on the listening score gains. Moreover, there was no significant difference between the two groups on their grammar ($F = 2.247, p = .160$), vocabulary ($F = .641, p = .439$), reading ($F = .022, p = .885$), or total ($F = 4.562, p = .054$) score gains.

Furthermore, as seen in Table 28, results of the ANOVA analyses of the post survey motivation of "like language learning" indicated that there was no significant difference between the two groups on their posttest listening ($F = .714, p = .423$), grammar ($F = .000, p = 1.000$), vocabulary ($F = .011, p = .919$), reading ($F = 4.082, p = .078$), or total ($F = .000, p = 1.000$) scores. There was a significant difference ($F = 7.021$, $p < .05$) between the disagreed group ($M = 15.80$, $SD = 5.263$) and the agreed group ($M = 8.40$, $SD = 3.362$) on the listening score gains. In addition, there was no significant difference between the two groups on their grammar ($F = 1.233, p = .299$), vocabulary ($F = 4.188, p = .075$), reading ($F = .388, p = .551$), or total ($F = 4.662, p = .063$) score gains.

Motivation of Continue the Interactions with English-Speaking North Americans in My Home Country

Descriptive statistics of pre survey motivation of continue the interactions with English-speaking North Americans in my home country.

The mean response to the pre survey motivation of "continue the interactions with English-speaking North Americans in my home country" was 3.39, and the standard deviation was .98. Prior to the beginning of the training program, about 56% of the participants reported that their motivation to learn English was to continue the interactions with English-speaking North Americans in their home country (strongly agree and agree). In addition, about 16% of the participants reported that their motivation for learning English was not to continue the interactions with English-speaking North Americans in their home country (strongly disagree and disagree).

Descriptive statistics of post survey motivation of continue the interactions with English-speaking North Americans in my home country.

The mean response to the post survey motivation of "continue the interactions with English-speaking North Americans in my home country" was 3, and the standard deviation was 1.03. After two months of the training program, about 33% of the participants reported that learning English was to continue the interactions with English-speaking North Americans in their home country (strongly agree and agree). In addition, about 33% of the participants reported that learning English was not to continue the interactions with English-speaking North Americans in their home country (strongly disagree and disagree).

Correlations between pre survey motivation of continue the interactions with English-speaking North Americans in my home country and the test scores.

The data distribution of the pre survey motivation of "continue the interactions with English-speaking North Americans in my home country" was normally distributed (Skewness = -.922, Kurtosis = .787). Therefore, Pearson correlation analyses were utilized to examine if correlation existed between the pre survey motivation of "continue the interactions with English-speaking North Americans in my home country", the pretest-posttest scores, and score gains. The Spearman rank correlation coefficient (rho) was utilized to analyze the correlations between the pre survey motivation of "continue the interactions with English-speaking North Americans in my home country" and the posttest listening scores.

As seen in Table 27, there was no significant correlation between the pre survey motivation of "continue the interactions with English-speaking North Americans in my home country" and the pretest listening ($r = .355, p = .148$), grammar ($r = .007, p = .977$), vocabulary ($r = .020, p = .938$), reading ($r = -.133, p = .598$), or total ($r = .122, p = .629$) scores. In addition, there was no significant correlation between the pre survey motivation of "continue the interactions with English-speaking North Americans in my home country" and the posttest listening ($r_s = .065, p = .797$), grammar ($r = -.126, p = .617$), vocabulary ($r = .252, p = .314$), reading ($r = -.045, p = .861$), or total ($r = .076, p = .765$) scores. Moreover, there was no significant correlation between the pre survey motivation of "continue the interactions with English-speaking North Americans in my home country" and the listening ($r = -.215, p = .392$), grammar ($r = -.124, p = .624$),

vocabulary ($r = .173, p = .493$), reading ($r = .125, p = .620$), or total ($r = -.070, p = .781$) score gains.

Correlations between post survey motivation of continue the interactions with English-speaking North Americans in my home country and the test scores.

The data distribution of the post survey motivation of "continue the interactions with English-speaking North Americans in my home country" was normally distributed (Skewness = .000, Kurtosis = -.472). Pearson correlation analyses were utilized to examine if correlation existed between the post survey motivation of "continue the interactions with English-speaking North Americans in my home country", the posttest scores, and score gains. In addition, a Spearman rank correlation coefficient analysis was performed to examine the correlation between the post survey motivation of "continue the interactions with English-speaking North Americans in my home country" and the posttest listening scores.

As seen in Table 27, there was no significant correlation between the post survey motivation of "continue the interactions with English-speaking North Americans in my home country" and the posttest listening ($r_s = .019, p = .939$), grammar ($r = .017, p = .947$), vocabulary ($r = .021, p = .934$), reading ($r = .019, p = .942$), or total ($r = .071, p = .780$) scores. There was no significant correlation between the post survey motivation of "continue the interactions with English-speaking North Americans in my home country" and the listening ($r = -.230, p = .359$), grammar ($r = -.063, p = .804$), vocabulary ($r = -.081, p = .750$), reading ($r = .207, p = .410$), or total ($r = -.119, p = .638$) score gains.

Table 27

Pearson Correlation and Spearman Rank Correlation Coefficient: Correlations between Pre-Post Survey Motivations of Like Language Learning, Continue the Interactions with English-Speakers, and the Test Scores

AEPE Test Scores		Pre Survey		Post Survey	
		Like Language Learning	Interact in Home Country	Like Language Learning	Interact in Home Country
Pretest	Listening	.581*	.355		
	Sig. (2-tailed)	.011	.148		
	Grammar	.097	.007		
	Sig. (2-tailed)	.701	.977		
	Vocabulary	.283	.020		
	Sig. (2-tailed)	.256	.938		
	Reading	.002	-.133		
	Sig. (2-tailed)	.995	.598		
	Total	.347	.122		
	Sig. (2-tailed)	.158	.629		
Posttest	Listening (rho)	.018	.065	-.116	.019
	Sig. (2-tailed)	.944	.797	.648	.939
	Grammar	-.269	-.126	.185	.017
	Sig. (2-tailed)	.281	.617	.463	.947
	Vocabulary	.233	.252	.095	.021
	Sig. (2-tailed)	.353	.314	.709	.934
	Reading	.027	-.045	.269	.019
	Sig. (2-tailed)	.917	.861	.280	.942
	Total	.024	.076	.133	.071
	Sig. (2-tailed)	.926	.765	.598	.780
Score Gain	Listening	-.462	-.215	-.485*	-.230
	Sig. (2-tailed)	.053	.392	.041	.359
	Grammar	-.345	-.124	-.157	-.063
	Sig. (2-tailed)	.161	.624	.535	.804
	Vocabulary	-.132	.173	-.351	-.081
	Sig. (2-tailed)	.603	.493	.153	.750
	Reading	.035	.125	.140	.207
	Sig. (2-tailed)	.892	.620	.578	.410
	Total	-.367	-.070	-.366	-.119
	Sig. (2-tailed)	.134	.781	.135	.638

Note. *Correlation is significant at the 0.05 level (2-tailed)

Table 28

Analysis of Variance: Comparison of Disagreed (n = 5) and Agreed (n = 5) Groups in Post Survey Motivation of Like Language Learning on the Test Scores

AEPE Test Scores	Group	Mean	*SD*	*F*	Sig.
Posttest					
Listening	Disagreed	34.00	3.391	.714	.423
	Agreed	32.20	3.347		
Grammar	Disagreed	13.40	3.578	.000	1.000
	Agreed	13.40	2.793		
Vocabulary	Disagreed	20.80	2.775	.011	.919
	Agreed	20.60	3.209		
Reading	Disagreed	8.80	1.789	4.082	.078
	Agreed	10.80	1.304		
Total	Disagreed	77.00	7.382	.000	1.000
	Agreed	77.00	9.798		
Score Gain					
Listening	Disagreed	15.80	5.263	7.021	.029*
	Agreed	8.40	3.362		
Grammar	Disagreed	5.00	5.148	1.233	.299
	Agreed	2.00	3.162		
Vocabulary	Disagreed	6.00	3.536	4.188	.075
	Agreed	2.60	1.140		
Reading	Disagreed	2.20	2.490	.388	.551
	Agreed	3.20	2.588		
Total	Disagreed	29.00	12.042	4.662	.063
	Agreed	16.20	5.541		

Note. *Correlation is significant at the 0.05 level (2-tailed).

Table 29

Analysis of Variance: Comparison of Disagreed (n = 4) and Agreed (n = 10) Groups in Pre Survey Motivation of Like Language Learning on Test Scores

AEPE Test Scores	Group	Mean	*SD*	*F*	Sig.
Pretest					
Listening	Disagreed	16.75	4.856	7.550	.018*
	Agreed	24.30	4.572		
Grammar	Disagreed	10.00	3.162	.222	.646
	Agreed	11.10	4.175		
Vocabulary	Disagreed	15.00	2.000	1.360	.266
	Agreed	17.80	4.541		
Reading	Disagreed	7.75	1.708	.001	.980
	Agreed	7.70	3.592		
Total	Disagreed	49.50	8.062	2.035	.179
	Agreed	60.90	14.888		
Posttest					
Listening	Disagreed	33.75	3.403	.036	.853
	Agreed	33.40	3.026		
Grammar	Disagreed	15.00	2.000	1.162	.302
	Agreed	12.70	4.001		
Vocabulary	Disagreed	20.50	2.887	.417	.530
	Agreed	21.60	2.875		
Reading	Disagreed	11.25	2.630	.022	.884
	Agreed	11.00	2.906		
Total	Disagreed	80.50	8.583	.105	.751
	Agreed	78.70	9.615		
Score Gain					
Listening	Disagreed	17.00	4.397	8.017	.015*
	Agreed	9.10	4.818		
Grammar	Disagreed	5.00	3.367	2.247	.160
	Agreed	1.60	3.978		
Vocabulary	Disagreed	5.50	3.317	.641	.439
	Agreed	3.80	3.676		
Reading	Disagreed	3.50	3.317	.022	.885
	Agreed	3.30	1.829		
Total	Disagreed	31.00	6.583	4.562	.054
	Agreed	17.80	11.448		

Note. *Correlation is significant at the 0.05 level (2-tailed).

Comparison of groups' test scores in pre-post survey motivations of continue the interactions with English-speaking North Americans in my home country.

Participants' responses to pre-post survey motivations of "continue the interactions with English-speaking North Americans in my home country" were aggregated and converted into two groups (disagree and agree); 1 (strongly disagree) and 2 (disagree) on the Likert scale were aggregated and converted into one group who disagreed with the pre-post survey statements; 4 (agree) and 5 (strongly agree) on the Likert scale were also aggregated and converted into another group who agreed with the statements. Analyses of variance (ANOVA) were utilized to analyze if there was a significant difference between the two groups on their pretest-posttest scores and score gains.

As seen in Table 30, results of the ANOVA analyses of the pre survey motivation of "continue the interactions with English-speaking North Americans in my home country" indicated that there was no significant difference between the two groups on their pretest listening ($F = 2.214, p = .165$), grammar ($F = .008, p = .928$), vocabulary ($F = .013, p = .910$), reading ($F = 2.102, p = .175$), or total ($F = .042, p = .841$) scores. There was no significant difference between the two groups on their posttest listening ($F = .121, p = .735$), grammar ($F = .194, p = .668$), vocabulary ($F = .280, p = .607$), reading ($F = .492, p = .498$), or total ($F = .010, p = .921$) scores. In addition, there was no significant difference between the two groups on their listening ($F = 1.364, p = .268$), grammar ($F = .125, p = .731$), vocabulary ($F = .326, p = .580$), reading ($F = 1.652, p = .225$), or total ($F = .103, p = .754$) score gains.

Furthermore, as seen in Table 31, results of the ANOVA analyses of the post survey motivation of "continue the interactions with English-speaking North Americans in my home country" indicated that there was no significant difference between the two groups on their posttest scores. In addition, results indicated that there was no significant difference between the two groups on their listening ($F = .435, p = .524$), grammar ($F = .155, p = .702$), vocabulary ($F = .050, p = .828$), reading ($F = .140, p = .716$), or total ($F = .240, p = .635$) score gains.

Table 30

Analysis of Variance: Comparison of Disagreed (n = 3) and Agreed (n = 10) Groups in Pre Survey Motivation of Continue the Interactions with English-Speakers on the Test Scores

AEPE	Group	Mean	*SD*	*F*	Sig.
Pretest Listening	Disagreed	18.33	9.292	2.214	.165
	Agreed	23.30	3.498		
Pretest Grammar	Disagreed	10.33	5.132	.008	.928
	Agreed	10.10	3.510		
Pretest Vocabulary	Disagreed	17.00	5.196	.013	.910
	Agreed	16.70	3.622		
Pretest Reading	Disagreed	9.67	2.517	2.102	.175
	Agreed	7.10	2.726		
Pretest Total	Disagreed	55.33	21.455	.042	.841
	Agreed	57.20	11.448		
Posttest Listening	Disagreed	32.67	3.215	.121	.735
	Agreed	33.40	3.204		
Posttest Grammar	Disagreed	14.33	2.082	.194	.668
	Agreed	13.20	4.211		
Posttest Vocabulary	Disagreed	20.33	3.512	.280	.607
	Agreed	21.30	2.584		
Posttest Reading	Disagreed	11.33	2.517	.492	.498
	Agreed	10.20	2.440		
Posttest Total	Disagreed	78.67	8.145	.010	.921
	Agreed	78.10	8.530		
Listening Gain	Disagreed	14.33	8.021	1.364	.268
	Agreed	10.10	4.771		
Grammar Gain	Disagreed	4.00	5.568	.125	.731
	Agreed	3.10	3.381		
Vocabulary Gain	Disagreed	3.33	2.517	.326	.580
	Agreed	4.60	3.534		
Reading Gain	Disagreed	1.67	2.517	1.652	.225
	Agreed	3.10	1.449		
Total Gain	Disagreed	23.33	13.317	.103	.754
	Agreed	20.90	11.070		

Table 31

Analysis of Variance: Comparison of Disagreed (n = 6) and Agreed (n = 6) Groups in Post Survey Motivation of Continue the Interactions with English-speakers on the Test Scores

AEPE Test Scores	Group	Mean	*SD*	*F*	Sig.
Posttest					
Listening	Disagreed	30.50	6.950	.227	.644
	Agreed	32.00	3.347		
Grammar	Disagreed	14.33	1.366	.138	.718
	Agreed	13.83	2.994		
Vocabulary	Disagreed	20.33	2.944	.000	1.000
	Agreed	20.33	2.338		
Reading	Disagreed	10.50	4.135	.000	1.000
	Agreed	10.50	1.049		
Total	Disagreed	75.67	13.352	.025	.877
	Agreed	76.67	7.840		
Score Gain					
Listening	Disagreed	10.33	7.967	.435	.524
	Agreed	8.00	3.406		
Grammar	Disagreed	2.67	4.320	.155	.702
	Agreed	1.83	2.858		
Vocabulary	Disagreed	2.67	2.875	.050	.828
	Agreed	2.33	2.251		
Reading	Disagreed	2.50	2.258	.140	.716
	Agreed	3.00	2.366		
Total	Disagreed	18.17	13.805	.240	.635
	Agreed	15.17	5.879		

Table 32

Results of Pre-Post Survey Motivations: Means and Standard Deviations

Motivation		Mean	Min/Max	*SD*
Meet Course Requirements	Pre Survey	3.11	1 – 5	1.231
	Post Survey	3.67	2 - 5	1.237
Definite Future Career	Pre Survey	3.56	1 – 5	1.338
	Post Survey	3.61	1 - 5	1.29
Purpose of Traveling	Pre Survey	2.5	1 – 4	1.150
	Post Survey	2.83	2 - 5	.786
Meet Various English-speaking People	Pre Survey	3.56	2 – 5	1.042
	Post Survey	3.17	2 - 5	.985
Interact with North Americans while Living in U.S.	Pre Survey	3.44	1 – 5	1.338
	Post Survey	2.83	1 - 5	1.249
Become A Better Educated Person	Pre Survey	3.44	1 – 5	1.338
	Post Survey	3.06	1 - 5	1.211
Gain Respect from Others	Pre Survey	2.44	1 – 4	.922
	Post Survey	2.28	1 - 3	.669
Possible Future Career	Pre Survey	3.94	2 – 5	1.056
	Post Survey	4.06	2 - 5	.802
Like Language Learning	Pre Survey	3.39	1 – 5	1.243
	Post Survey	3.00	1 - 5	1.138
Continue Interacting with English-speaking North Americans	Pre Survey	3.39	1 – 5	.979
	Post Survey	3.00	1 - 5	1.029

Comparison of Difference between Pre and Post Survey Motivations

Paired-samples *t* tests were utilized to analyze if there was a significant difference between participants' pre and post motivations for the study of English. As seen in Table 33, results indicated that the increase on the post survey motivation of "meet course requirement" ($M = 3.67$, $SD = 1.237$) as compared to the pre survey motivation of "meet course requirement" ($M = 3.11$, $SD = 1.231$) was significant ($t = -2.149$, $p < .05$).

The results showed that there was no significant difference ($t = -.148$, $p = .884$) between the pre survey motivation of "definite future career in aviation" ($M = 3.56$, $SD =$

1.338) and the post survey motivation of "definite future career in aviation" ($M = 3.61$, $SD = 1.290$). There was no significant difference ($t = 1.381$, $p = .185$) between the pre survey motivation of "meet various English-speaking people" ($M = 3.56$, $SD = 1.042$) and the post survey motivation of "meet various English-speaking people" ($M = 3.17$, $SD = .985$). Moreover, there was no significant difference ($t = 1.377$, $p = .186$) between the pre survey motivation of "interact with North Americans while living in the United States" ($M = 3.44$, $SD = 1.338$) and the post survey motivation of "interact with North Americans while living in the United States" ($M = 2.83$, $SD = 1.249$). There was no significant difference ($t = .891$, $p = .385$) between the pre survey motivation of "become a better educated person" ($M = 3.44$, $SD = 1.338$) and the post survey motivation of "become a better educated person" ($M = 3.06$, $SD = 1.211$).

Furthermore, there was no significant difference ($t = .900$, $p = .381$) between the pre survey motivation of "gain respect from others" ($M = 2.44$, $SD = .922$) and the post survey motivation of "gain respect from others" ($M = 2.28$, $SD = .669$). There was no significant difference ($t = -.437$, $p = .668$) between the pre survey motivation of "possible future career" ($M = 3.94$, $SD = 1.056$) and the post survey motivation of "possible future career" ($M = 4.06$, $SD = .802$). There was no significant difference ($t = 1.162$, $p = .261$) between the pre survey motivation of "like language learning" ($M = 3.39$, $SD = 1.243$) and the post survey motivation of "like language learning" ($M = 3.00$, $SD = 1.138$).

The results also indicated that there was no significant difference ($t = 1.800$, $p = .090$) between the pre survey motivation of "continue the interactions with English-speaking North Americans in my home country" ($M = 3.39$, $SD = .979$) and the post

survey motivation of "continue the interactions with English-speaking North Americans in my home country" ($M = 3.00$, $SD = 1.029$).

The data distribution of the post survey motivation of "traveling" indicated that it was not normally distributed (Skewness = 1.136, Kurtosis = 2.274). Therefore, the nonparametric statistical analysis of the Wilcoxon matched-pairs signed-ranks test was utilized to examine if difference existed between the pre and post survey motivations of "traveling". As seen in Table 34, the results indicated that there was no significant difference ($z = -1.344$, $p = .179$) between the pre survey motivation of "traveling" ($M = 2.50$, $SD = 1.150$) and the post survey motivation of "traveling" ($M = 2.83$, $SD = .786$).

Table 33

Paired-Samples t Tests: Comparisons of Pre and Post Survey Motivations

Motivation (Pretest – Posttest)	Paired Differences Mean	Paired Differences *SD*	*t*	*df*	Sig. (2-tailed)
Meet Course Requirements	-.56	1.097	-2.149	17	.046*
Definite Future Career in Aviation	-.06	1.589	-.148	17	.884
Meet Various English-speaking People	.39	1.195	1.381	17	.185
Interact with North American while Living in U.S.	.61	1.883	1.377	17	.186
Become A Better Educated Person	.39	1.852	.891	17	.385
Gain Respect from Others	.17	.786	.900	17	.381
Possible Future Career	-.11	1.079	-.437	17	.668
Like Language Learning	.39	1.420	1.162	17	.261
Continue Interact English-speaking North Americans	.39	.916	1.800	17	.090

Note. *Correlation is significant at the 0.05 level (2-tailed).

Table 34

Wilcoxon Matched-Pairs Signed-Ranks Test: Pre and Post Survey Motivation of Traveling

Traveling Motivation (Pretest – Posttest)	N	Mean Rank	Sum of Ranks	*z*	Sig. (2-tailed)
Negative Ranks	5	4.50	22.50	-1.344	.179
Positive Ranks	7	7.93	55.50		
Ties	6				
Total	18				

Correlations between Demographics and Pre Survey Motivations

As seen in Table 35, the results indicated that there was no significant correlation between participants' years of prior experience studying English and their pre survey motivations. There was no significant correlation between participants' years of aviation training experience and their pre survey motivations. On the other hand, results indicated that there was a significant positive correlation between participants' years of prior experience in working with computers for language learning purposes and their pre survey motivation of "interact with North Americans while living in the United States" ($r = .491, p < .05$). In addition, as seen in Table 35, there was no significant correlation between participants' ages and their pre survey motivations.

Table 35

Pearson Correlation and Spearman Rank Correlation Coefficient (rho): Correlations between Pre Survey Motivations and Demographics

Pre Survey Motivation	Aviation Training	Study English	Work w/ Computer	Age (rho)
Course Requirements	.306	.118	.268	.092
Sig. (2-tailed)	.217	.640	.282	.715
Definite Career	.238	-.172	-.069	.068
Sig. (2-tailed)	.342	.494	.785	.789
Traveling	-.065	.094	-.224	-.374
Sig. (2-tailed)	.799	.712	.371	.127
Meet English-speakers	.127	.042	.005	-.225
Sig. (2-tailed)	.615	.869	.984	.369
Interact English-speakers	.402	.143	.491*	-.068
Sig. (2-tailed)	.098	.571	.038	.788
Better Educated Person	.235	.041	.014	.090
Sig. (2-tailed)	.348	.873	.955	.723
Gain Respect	-.224	-.323	-.192	.056
Sig. (2-tailed)	.371	.191	.444	.825
Possible Future Career	-.161	-.199	.076	-.008
Sig. (2-tailed)	.524	.429	.764	.976
Like Language Learning	-.183	.001	.001	-.356
Sig. (2-tailed)	.467	.997	.997	.147
Continue Interactions	.034	.041	.052	.265
Sig. (2-tailed)	.894	.871	.839	.288

Note. *Correlation is significant at the 0.05 level (2-tailed).

Correlations between Demographics and Post Survey Motivations

As seen in Table 36, results indicated that there was no significant correlation between participants' years of prior experience studying English and their post survey motivations. There was no significant correlation between participants' years of aviation training and their post survey motivations. Moreover, there was no significant correlation between participants' years of prior experience in working with computers for language

learning purposes and their post survey motivations. In addition, as seen in Table 36, there was no significant correlation between participants' ages and their post survey motivations.

Table 36

Pearson Correlation and Spearman Rank Correlation Coefficient (rho): Correlations between Post Survey Motivations and Demographics

Post Survey Motivations	Aviation Training	Studying English	Work w/ Computer	Age (rho)
Course Requirements	.442	.121	-.066	.307
Sig. (2-tailed)	.067	.632	.794	.216
Definite Career	.032	-.183	-.268	-.214
Sig. (2-tailed)	.899	.468	.283	.393
Traveling (rho)	-.257	.111	-.246	-.094
Sig. (2-tailed)	.304	.662	.324	.712
Meet English-speakers	.025	-.056	.154	.163
Sig. (2-tailed)	.921	.824	.543	.518
Interact w/ English-speakers	-.139	-.003	-.141	-.011
Sig. (2-tailed)	.582	.992	.577	.965
Become Better Educated Person	.048	-.247	.197	.334
Sig. (2-tailed)	.851	.323	.433	.176
Gain Respect from Others	-.068	-.333	-.014	.414
Sig. (2-tailed)	.789	.177	.955	.088
Possible Future Career	.119	.066	.297	.237
Sig. (2-tailed)	.639	.794	.231	.344
Like Language Learning	-.164	.017	-.043	.060
Sig. (2-tailed)	.516	.946	.865	.814
Continue Interaction	-.036	-.076	-.310	.142
Sig. (2-tailed)	.887	.764	.210	.574

Attitudes toward CALL

Descriptive Statistics of Pre Survey Attitudes toward CALL

A summary of the descriptive statistics of the results of the 18 participants' pre survey responses to the items of attitudes toward learning English with the Computer-

Assisted Language Learning (CALL) technology is presented in Table 37. As seen in Table 37, the mean response to the item of "learning English with CALL is beneficial" was 4.5, and the standard deviation was .99. The mean response to the item of "learning English with CALL is interesting" was 3.78, and the standard deviation was 1.06.

Moreover, the mean response to the item of "learning English with CALL is enjoyable" was 3.67, and the standard deviation was .84. The mean response to the item of "learning English with CALL is difficult" was 2.28, and the standard deviation was .83. Furthermore, the mean response to the item of "learning English with CALL is uncomfortable" was 2.11, and the standard deviation was .76. The mean response to the item of "prefer no computer" was 1.78, and the standard deviation was .81.

Table 37

Results of Pre-Post Survey Attitudes toward CALL

Attitude		Mean	Min/Max	*SD*
Beneficial	Pre Survey	4.5	1 - 5	.985
	Post Survey	4.39	1 - 5	.979
Interesting	Pre Survey	3.78	1 - 5	1.060
	Post Survey	4.17	2 - 5	.857
Enjoyable	Pre Survey	3.67	2 - 5	.840
	Post Survey	3.72	2 - 5	1.074
Difficult	Pre Survey	2.28	1 - 4	.826
	Post Survey	2.11	1 - 5	1.079
Uncomfortable	Pre Survey	2.11	1 - 4	.758
	Post Survey	2.11	1 - 4	.758
Prefer No Computer	Pre Survey	1.78	1 - 4	.808
	Post Survey	1.72	1 - 4	.826

Correlations between Pre Survey Attitudes toward Computer Assisted Language Learning and the Test Scores

Correlations between the attitude of beneficial and the test scores.

The data distribution of the pre survey attitude of "learning English with CALL is beneficial" was not normally distributed (Skewness = -2.90, Kurtosis = 9.83). Therefore, Spearman rank correlation coefficient analyses were utilized to examine if correlation existed between participants' pre survey attitude of "beneficial", the pretest-posttest scores, and score gains.

As seen in Table 38, there was no significant correlation between the pre survey attitude of "beneficial" and the pretest listening (r_s = -.254, p = .310), grammar (r_s = -.247, p = .323), vocabulary (r_s = -.277, p = .266), reading (r_s = -.097, p = .703), or total (r_s = -.181, p = .473) scores. In addition, results indicated that there was no significant correlation between the pre survey attitude of "beneficial" and the posttest listening (r_s = -.224, p = .372), grammar (r_s = -.434, p = .072), vocabulary (r_s = -.364, p = .137), reading (r_s = .213, p = .396), or total (r_s = -.257, p = .303) scores.

Moreover, results indicated that there was a significant positive correlation between the pre survey attitude of "beneficial" and the reading score gains (r_s = .487, p < 05). Furthermore, there was no significant correlation between the pre survey attitude of "beneficial" and the listening (r_s = .320, p = .196), grammar (r_s = -.054, p = .833), vocabulary (r_s = .256, p = .305), or total (r_s = .340, p = .168) score gains.

Correlations between the attitude of interesting and the test scores.

The data distribution of the pre survey attitude of "learning English with CALL is interesting" was normally distributed (Skewness = -1.169, Kurtosis = 1.665). Therefore,

Pearson correlation analyses were utilized to examine if correlation existed between the pre survey attitude of "interesting", the pretest-posttest scores, and score gains. In addition, Spearman rank correlation coefficient was utilized to analyze the correlation between the pre survey attitude of "interesting" and the posttest listening scores. As seen in Table 38, there was no significant correlation between the pre survey attitude of "interesting" and the pretest listening (r = -.332, p = .178), grammar (r = .412, p = .090), vocabulary (r = .264, p = .290), reading (r = -.050, p = .845), or total (r = .313, p = .206) scores.

Moreover, results indicated that there was no significant correlation between the pre survey attitude of "interesting" and the posttest listening (r_s = -.272, p = .276), grammar (r = -.349, p = .156), vocabulary (r = -.002, p = .993), reading (r = .153, p = .546), or total (r = -.104, p = .683) scores. In addition, there was a significant negative correlation between the pre survey attitude of "learning English with CALL is interesting" and the grammar score gains (r = -.733, $p < .01$). Furthermore, there was no significant correlation between the pre survey attitude of "interesting" and the listening (r = -.369, p = .132), vocabulary (r = -.293, p = .238), reading (r = .282, p = .257), or total (r = -.440, p = .068) score gains.

Correlations between the attitude of enjoyable and the test scores.

The data distribution of the pre survey attitude of "learning English with CALL is enjoyable" was normally distributed (Skewness = -.595, Kurtosis = .201). Therefore, Pearson correlation analyses were utilized to examine if correlation existed between the pre survey attitude of "enjoyable", the pretest-posttest scores, and score gains. As seen in Table 38, there was no significant correlation between the pre survey attitude of

"enjoyable" and the pretest listening (r = .310, p = .210), grammar (r = .238, p = .341), vocabulary (r = .222, p = .377), reading (r = -.060, p = .813), or total (r = .242, p = .333) scores.

Moreover, there was no significant correlation between the pre survey attitude of "enjoyable" and the posttest listening (r_s = -.382, p = .118), grammar (r = -.410, p = .091), vocabulary (r = -.171, p = .498), reading (r = .015, p = .952), or total (r = -.270, p = .279) scores. In addition, results indicated that there was a significant negative correlation between the pre survey attitude of "enjoyable" and the grammar score gains (r = -.617, p < .01). There was a significant negative correlation between the pre survey attitude of "enjoyable" and the total score gains (r = -.506, p <. 05). Furthermore, there was no significant correlation between the pre survey attitude of "enjoyable" and the listening (r = -.457, p = .056), vocabulary (r = -.376, p = .124), or reading (r = .106, p = .676) score gains.

Correlations between the attitude of difficult and the test scores.

The data distribution of the pre survey attitude of "learning English with CALL is difficult" was normally distributed (Skewness = .110, Kurtosis = -.293). Therefore, Pearson correlation analyses were utilized to examine if correlation existed between the pre survey attitude of "difficult", the pretest-posttest scores, and score gains. As seen in Table 38, there was no significant correlation between the pre survey attitude of "difficult" and the pretest listening (r = .076, p = .763), grammar (r = .135, p = .592), vocabulary (r = -.054, p = .832), reading (r = .348, p = .157), or total (r = .133, p = .599) scores.

Moreover, there was no significant correlation between the pre survey attitude of "difficult" and the posttest listening (r_s = .057, p = .823), grammar (r = -.161, p = .522), vocabulary (r = -.029, p = .909), reading (r = .277, p = .266), or total (r = .010, p = .969) scores. Furthermore, there was no significant correlation between the pre survey attitude of "difficult" and the listening (r = -.091, p = .718), grammar (r = -.284, p = .253), vocabulary (r = .037, p = .884), reading (r = -.106, p = .677), or total (r = -.140, p = .579) score gains.

Correlations between the attitude of uncomfortable and the test scores.

The data distribution of the pre survey attitude of "learning English with CALL is uncomfortable" was normally distributed (Skewness = .715, Kurtosis = 1.247). Therefore, Pearson correlation analyses were utilized to examine if correlation existed between the pre survey attitude of "uncomfortable", the pretest-posttest scores, and score gains. As seen in Table 38, there was no significant correlation between the pre survey attitude of "uncomfortable" and the pretest listening (r = .135, p = .594), grammar (r = .076, p = .764), vocabulary (r = -.035, p = .889), reading (r = -.078, p = .760), or total (r = .048, p = .851) scores.

The results indicated that there was no significant correlation between the pre survey attitude of "uncomfortable" and the posttest listening (r_s = .348, p = .158), grammar (r = .221, p = .379), vocabulary (r = .271, p = .277), reading (r = -.107, p = .674), or total (r = .206, p = .413) scores. Furthermore, there was no significant correlation between the pre survey attitude of "uncomfortable" and the listening (r = .043, p = .865), grammar (r = .128, p = .613), vocabulary (r = .249, p = .320), reading (r = -.039, p = .878), or total (r = .126, p = .617) score gains.

Correlations between the attitude of prefer no computer and the test scores.

The data distribution of the pre survey attitude of "prefer no computer" was not normally distributed (Skewness = 1.203, Kurtosis = 2.118). Therefore, Spearman rank correlation coefficient analyses were utilized to examine if correlation existed between the pre survey attitude of "prefer no computer", the pretest-posttest scores, and score gains. As seen in Table 38, there was no significant correlation between the pre survey attitude of "prefer no computer" and the pretest listening (r_s = .006, p = .982), grammar (r_s = .113, p = .656), vocabulary (r_s = -.176, p = .484), reading (r_s = -.226, p = .367), or total (r_s = -.050, p = .843) scores.

Moreover, there was no significant correlation between the pre survey attitude of "prefer no computer" and the posttest listening (r_s = -.010, p = .968), grammar (r_s = .073, p = .773), vocabulary (r_s = .008, p = .975), reading (r_s = -.215, p = .391), or total (r_s = -.047, p = .853) scores. Furthermore, there was no significant correlation between the pre survey attitude of "prefer no computer" and the listening (r_s = -.308, p = .214), grammar (r_s = -.033, p = .895), vocabulary (r_s = .054, p = .832), reading (r_s = -.127, p = .615), or total (r_s = .220, p = .379) score gains.

Table 38

Pearson Correlation and Spearman Rank Correlation Coefficient (rho): Correlations between Pre Survey Attitudes toward CALL and the Test Scores

AEPE Test Scores		Pre Survey Attitudes toward CALL					
		Benefit (rho)	Interest	Enjoy	Difficult	Un-comfort	No Comp. (rho)
Pretest	Listening	-.254	.332	.310	.076	.135	.006
	Sig.	.310	.178	.210	.763	.594	.982
	Grammar	-.247	.412	.238	.135	.076	.113
	Sig.	.323	.090	.341	.592	.764	.656
	Vocabulary	-.277	.264	.222	-.054	-.035	-.176
	Sig.	.266	.290	.377	.832	.889	.484
	Reading	-.097	-.050	-.060	.348	-.078	-.226
	Sig.	.703	.845	.813	.157	.760	.367
	Total	-.181	.313	.242	.133	.048	-.050
	Sig.	.473	.206	.333	.599	.851	.843
Posttest	Listening	-.224	-.272	-.382	.057	.348	-.010
	Sig. (rho)	.372	.276	.118	.823	.158	.968
	Grammar	-.434	-.349	-.410	-.161	.221	.073
	Sig.	.072	.156	.091	.522	.379	.773
	Vocabulary	-.364	-.002	-.171	-.029	.271	.008
	Sig.	.137	.993	.498	.909	.277	.975
	Reading	.213	.153	.015	.277	-.107	-.215
	Sig.	.396	.546	.952	.266	.674	.391
	Total	-.257	-.104	-.270	.010	.206	-.047
	Sig.	.303	.683	.279	.969	.413	.853
Score Gain	Listening	.320	-.369	-.457	-.091	.043	-.308
	Sig.	.196	.132	.056	.718	.865	.214
	Grammar	-.054	-.733**	-.617**	-.284	.128	-.033
	Sig.	.833	.001	.006	.253	.613	.895
	Vocabulary	.256	-.293	-.376	.037	.249	.054
	Sig.	.305	.238	.124	.884	.320	.832
	Reading	.487*	.282	.106	-.106	-.039	-.127
	Sig.	.041	.257	.676	.677	.878	.615
	Total	.340	-.440	-.506*	-.140	.126	-.220
	Sig.	.168	.068	.032	.579	.617	.379

Note. *Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

Descriptive Statistics of Post Survey Attitudes toward Computer Assisted Language Learning

A summary of the descriptive statistics of the results of the 18 participants' post survey responses to the items of attitudes toward learning English with the Computer-Assisted Language Learning (CALL) technology is presented in Table 37. As seen in Table 37, the mean response to the item of "learning English with CALL is beneficial" was 4.39, and the standard deviation was .98. In addition, the mean response to the item of "learning English with CALL is interesting" was 4.17, and the standard deviation was .86.

Moreover, the mean response to the item of "learning English with CALL is enjoyable" was 3.72, and the standard deviation was 1.07. The mean response to the item of "learning English with CALL is difficult" was 2.11, and the standard deviation was 1.08. Furthermore, the mean response to the item of "learning English with CALL is uncomfortable" was 2.11, and the standard deviation was .76. The mean response to the item of "prefer no computer" was 1.72, and the standard deviation was .83.

Correlations between Post Survey Attitudes toward CALL and the Test Scores

Correlations between the attitude of beneficial and the test scores.

The data distribution of the post survey attitude of "learning English with CALL is beneficial" was not normally distributed (Skewness = -2.617, Kurtosis = 8.588). Therefore, Spearman rank correlation coefficient analyses were utilized to examine if correlation existed between participants' post survey attitude of "beneficial", the posttest scores, and score gains. As seen in Table 39, there was a significant positive correlation

between the post survey attitude of "beneficial", the posttest listening scores ($r_s = .672, p < .01$).

There was a significant positive correlation between the post survey attitude of "beneficial" and the posttest vocabulary scores ($r_s = .522, p < .05$). In addition, there was a significant positive correlation between the post survey attitude of "beneficial" and the posttest total scores ($r_s = .541, p < .05$). Moreover, results indicated that there was no significant correlation between the post survey attitude of "beneficial" and the posttest grammar ($r_s = -.011, p = .964$), or reading ($r_s = .433, p = .703$) scores. Furthermore, there was no significant correlation between the post survey attitude of "beneficial" and the listening ($r_s = .110, p = .663$), grammar ($r_s = -.038, p = .881$), vocabulary ($r_s = .223, p = .374$), reading ($r_s = .237, p = .345$), or total ($r_s = .130, p = .607$) score gains.

Correlations between the attitude of interesting and the test scores.

The data distribution of the post survey attitude of "learning English with CALL is interesting" was normally distributed (Skewness = -.980, Kurtosis = .903). Pearson correlation analyses were utilized to examine if correlation existed between the post survey attitude of "interesting", the posttest scores, and score gains. In addition, a Spearman rank correlation coefficient analysis was performed to examine the correlation between the post survey attitude of "interesting" and the posttest listening scores.

As seen in Table 39, there was no significant correlation between the post survey attitude of "interesting" and the posttest listening ($r_s = .043, p = .867$), grammar ($r = -.044, p = .862$), vocabulary ($r = .234, p = .350$), or total ($r = .417, p = .085$) scores. Moreover, results indicated that there was a significant positive correlation between the post survey attitude of "interesting" and posttest reading scores ($r = .518, p < .05$). There

was a significant positive correlation between the post survey attitude of "interesting" and reading score gains ($r = .585, p < .05$). Furthermore, there was no significant correlation between the post survey attitude of "interesting" and the listening ($r = .080, p = .751$), grammar ($r = -.047, p = .852$), vocabulary ($r = -.068, p = .789$), or total ($r = .113, p = .654$) score gains.

Correlations between the attitude of enjoyable and the test scores.

The data distribution of the post survey attitude of "learning English with CALL is enjoyable" was normally distributed (Skewness = -.335, Kurtosis = -1.040). Pearson correlation analyses were utilized to examine if correlation existed between the post survey attitude of "enjoyable", the posttest scores, and score gains. In addition, a Spearman rank correlation coefficient analysis was performed to examine the correlation between the post survey attitude of "enjoyable" and the posttest listening scores.

As seen in Table 39, there was no significant correlation between the post survey attitude of "enjoyable" and the posttest listening ($r_s = .263, p = .187$), grammar ($r = -.006, p = .980$), vocabulary ($r = .343, p = .164$), reading ($r = .429, p = .076$), or total ($r = .421, p = .082$) scores. In addition, there was a significant positive correlation between the post survey attitude of "enjoyable" and reading score gains ($r = .627, p < .01$). Moreover, there was no significant correlation between the post survey attitude of "enjoyable" and the listening ($r = .052, p = .838$), grammar ($r = -.098, p = .699$), vocabulary ($r = .003, p = .992$), or total ($r = .112, p = .657$) score gains.

Correlations between the attitude of difficult and the test scores.

The data distribution of the post survey attitude of "learning English with CALL is difficult" was not normally distributed (Skewness = 1.339, Kurtosis = 2.039).

Therefore, Spearman rank correlation coefficient analyses were utilized to examine if correlation existed between participants' post survey attitude of "difficult", the posttest scores, and score gains. As seen in Table 39, there was no significant correlation between the post survey attitude of "difficult" and the posttest listening (r_s = -.299, p = .229), grammar (r_s = .120, p = .636), vocabulary (r_s = -.186, p = .461), reading (r_s = -.150, p = .552), or total (r_s = -.152, p = .547) scores. In addition, there were significant negative correlations between the post survey attitude of "difficult" and the listening (r_s = -.616, p < .01) and the total (r_s = -.571, p < .05) score gains. Furthermore, there was no significant correlation between the post survey attitude of "difficult" and grammar (r_s = -.318, p = .198), vocabulary (r_s = -.414, p = .088), or reading (r_s = -.286, p = .250) score gains.

Correlations between the attitude of uncomfortable and the test scores.

The data distribution of the post survey attitude of "learning English with CALL is uncomfortable" was normally distributed (Skewness = .715, Kurtosis = 1.247). Pearson correlation analyses were utilized to examine if correlation existed between the post survey attitude of "uncomfortable", the posttest scores, and score gains. In addition, a Spearman rank correlation coefficient analysis was performed to examine the correlation between the post survey attitude of "uncomfortable" and the posttest listening scores.

As seen in Table 39, there was no significant correlation between the post survey attitude of "uncomfortable" and the posttest listening (r_s = -.447, p = .063), grammar (r = .313, p = .206), vocabulary (r = -.381, p = .118), reading (r = -.435, p = .071), or total (r = -.431, p = .074) scores. Moreover, there was no significant correlation between the post survey attitude of "uncomfortable" and the listening (r = -.100, p = .694), grammar (r =

.021, p = .933), vocabulary (r = -.344, p = .163), reading (r = -.355, p = .148), or total (r = -.210, p = .404) score gains.

Correlations between the attitude of prefer no computer and the test scores.

The data distribution of the post survey attitude of "prefer no computer" was not normally distributed (Skewness = 1.297, Kurtosis = 2.103). Therefore, Spearman rank correlation coefficient analyses were utilized to examine if correlation existed between participants' post survey attitude of "prefer no computer", the posttest scores, and score gains. As seen in Table 39, there was no significant correlation between the post survey attitude of "prefer no computer" and the posttest listening (r_s = -.341, p = .166), grammar (r_s = .140, p = .581), vocabulary (r_s = -.102, p = .686), reading (r_s = -.003, p = .989), or total (r_s = -.118, p = .640) scores. Furthermore, there was no significant correlation between the post survey attitude of "prefer no computer" and the listening (r_s = .141, p = .578), grammar (r_s = .097, p = .702), vocabulary (r_s = -.205, p = .414), reading (r_s = -.134, p = .596), or total (r_s = .023, p = .927) score gains.

Table 39

Pearson Correlation and Spearman Rank Correlation Coefficient (rho): Correlations between Post Survey Attitudes toward CALL and the Test Scores

AEPE		Post Survey Attitudes toward CALL					
		Benefit (rho)	Interest	Enjoy	Difficult (rho)	Un-Comfort	No Comp. (rho)
Posttest							
	Listening	.672**	.043	.263	-.299	-.447	-.341
	Sig. (rho)	.002	.867	.187	.229	.063	.166
	Grammar	-.011	-.044	-.006	.120	.313	.140
	Sig.	.964	.862	.980	.636	.206	.581
	Vocabulary	.522*	.234	.343	-.186	-.381	-.102
	Sig.	.026	.350	.164	.461	.118	.686
	Reading	.433	.518*	.429	-.150	-.435	-.003
	Sig.	.073	.028	.076	.552	.071	.989
	Total	.541*	.417	.421	-.152	-.431	-.118
	Sig.	.021	.085	.082	.547	.074	.640
Score Gain							
	Listening	.110	.080	.052	-.616**	-.100	.141
	Sig.	.663	.751	.838	.006	.694	.578
	Grammar	-.038	-.047	-.098	-.318	.021	.097
	Sig.	.881	.852	.699	.198	.933	.702
	Vocabulary	.223	-.068	.003	-.414	-.344	-.205
	Sig.	.374	.789	.992	.088	.163	.414
	Reading	.237	.585*	.627**	-.286	-.355	-.134
	Sig.	.345	.011	.005	.250	.148	.596
	Total	.130	.113	.112	-.571*	-.210	.023
	Sig.	.607	.654	.657	.013	.404	.927

Note. *Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

Comparison of Difference between Pre and Post Survey Attitudes toward Computer Assisted Language Learning

Paired-samples *t* tests were utilized to analyze the normally distributed data of attitudes toward CALL to examine if there was a significant difference between participants' pre and post survey attitudes toward learning English with Computer Assisted Language Learning (CALL). In addition, the nonparametric Wilcoxon matched-pairs signed-ranks tests were utilized to analyze the not normally distributed data of attitudes toward CALL to examine if there was a significant difference between participants' pre and post survey attitudes toward CALL.

The data distributions of pre survey (Skewness = -2.907, Kurtosis = 9.835) and post survey (Skewness = -2.617, Kurtosis = 8.588) attitudes of "learning with CALL is beneficial" were not normally distributed. Therefore, the nonparametric analyses of the Wilcoxon matched-pairs signed-ranks tests were utilized to examine if difference existed between the pre and post survey attitudes of "beneficial". As seen in Table 41, the results indicated that there was no significant difference (z = -.663, p = .507) between the pre survey attitude of "beneficial" (M = 4.5, SD = .985) and the post survey attitude of "beneficial" (M = 4.39, SD = .979).

Paired-samples *t* test was utilized to analyze if there was a significant difference between participants' pre survey (Skewness = -1.169, Kurtosis = 1.665) and post survey (Skewness = -.980, Kurtosis = .903) attitudes of "learning English with CALL is interesting". As seen in Table 40, results indicated that there was no significant difference (t = -1.519, p = .130) between the pre survey attitude of "interesting" (M = 2.28, SD = 1.060) and the post survey attitude of "interesting" (M = 4.17, SD = .857).

Paired-samples *t* test was utilized to analyze if there was a significant difference between participants' pre survey (Skewness = -.595, Kurtosis = .201) and post survey (Skewness = -.335, Kurtosis = -1.040) attitudes of "learning English with CALL is enjoyable". As seen in Table 40, results indicated that there was no significant difference ($t = -.203$, $p = .842$) between the pre survey attitude of "enjoyable" ($M = 3.67$, $SD = .840$) and the post survey attitude of "enjoyable" ($M = 3.72$, $SD = 1.074$).

Wilcoxon matched-pairs signed-ranks test was utilized to examine if a significant difference existed between the pre and post survey attitudes of "learning English with CALL is difficult". As seen in Table 41, the results indicated that there was no significant difference ($z = -.711$, $p = .477$) between the pre survey attitude of "difficult" ($M = 4.5$, $SD = .826$) and the post survey attitude of "difficult" ($M = 2.11$, $SD = 1.079$).

Paired-samples *t* test was utilized to analyze if there was a significant difference between participants' pre survey (Skewness = .715, Kurtosis = 1.247) and post survey (Skewness = .715, Kurtosis = 1.247) attitudes of "learning English with CALL is uncomfortable". As seen in Table 40, results indicated that there was no significant difference ($t = .000$, $p = 1.000$) between the pre survey attitude of "uncomfortable" ($M = 2.11$, $SD = .758$) and the post survey attitude of "uncomfortable" ($M = 2.11$, $SD = .758$).

Wilcoxon matched-pairs signed-ranks test was utilized to examine if difference existed between the pre and post survey attitudes of "prefer no computer". As seen in Table 41, results indicated that there was no significant difference ($z = -.214$, $p = .831$) between the pre survey attitude of "prefer no computer" ($M = 1.78$, $SD = .808$) and the post survey attitude of "prefer no computer" ($M = 1.72$, $SD = .826$).

Table 40

Paired-Samples t Tests: Comparison of Pre and Post Survey Attitudes toward CALL

Attitudes toward CALL (Pretest – Posttest)	Paired Differences Mean	Paired Differences *SD*	*t*	*df*	Sig. (2-tailed)
Interesting	-.3	1.037	-1.519	17	.130
Enjoyable	-.06	1.162	-.203	17	.842
Uncomfortable	.00	1.085	.000	17	1.000

Table 41

Wilcoxon Matched-Pairs Signed-Ranks Tests: Pre and Post Survey Attitudes toward CALL

Attitudes toward Learning English with CALL (Posttest – Pretest)	*z*	Sig. (2-tailed)
Learning with CALL is Beneficial	-.663	.507
Learning with CALL is Difficult	-.711	.477
Prefer No Computer	-.214	.831

Correlations between the Pre-Post Survey Attitudes toward Computer Assisted Language Learning and the Pre-Post Survey Motivations

Spearman rank correlation coefficient tests were utilized to examine if correlation existed between the pre survey attitudes (beneficial and prefer no computer) and the pre-post survey motivations. In addition, Pearson correlation tests were utilized to examine if correlation existed between the pre survey attitudes (interesting, enjoyable, difficult, and uncomfortable) and the pre-post survey motivations.

As seen in Table 42, there were significant positive correlations between the pre survey attitude of "beneficial" and the post survey motivation of "course requirement" (*rs*

= .482, $p < .05$), and the pre survey motivation of "become a better educated person" (r_s = .624, $p < .01$). In addition, there were significant positive correlations between the pre survey attitude of "interesting" and the pre survey motivations of "become a better educated person" ($r = .696$, $p < .01$), and "like language learning" ($r = .516$, $p < .05$).

There were significant positive correlations between the pre survey attitude of "enjoyable" and the pre survey motivations of "become a better educated person" (r = .663, $p < .5$), "gain respect from others" ($r = .506$, $p < .05$), and "like language learning" ($r = .526$, $p < .05$). Moreover, there was a significant positive correlation between the pre survey attitude of "difficult" and the post survey motivation of "gain respect from others" ($r = .491$, $p < .05$). Results indicated that there was no significant correlation between the pre survey attitudes of "uncomfortable" and "prefer no computer", and the pre-post survey motivations.

Furthermore, Spearman rank correlation coefficient tests were utilized to examine if correlation existed between the post survey attitudes (beneficial, difficult, and prefer no computer) and the post survey motivations. Pearson correlation analyses were utilized to examine if correlation existed between the post survey attitudes (interesting and enjoyable) and the post survey motivations.

As seen in Table 43, there was no significant correlation between the post survey attitudes (beneficial, interesting, enjoyable, difficult, and uncomfortable) and all the post survey motivations. On the other hand, there were significant negative correlations between the post survey attitude of "prefer no computer" and the post survey motivations of "definite future career in aviation" (r_s = -.685, $p < .01$), and "interact with English-speakers while living in United States" (r_s = -.580, $p < .05$).

Table 42: *Pearson Correlation and Spearman Rank Correlation Coefficient (rho): Correlations between the Pre Survey Attitudes toward CALL and the Pre-Post Motivations*

Motivation		Benefit (rho)	Interest	Enjoy	Difficult	Un-comfort	No Comp. (rho)
Course Requirement	Pre Survey	.465	.335	.152	.257	-.014	-.072
		.052	.174	.548	.303	.956	.778
	Post Survey	.482*	.254	.226	.096	-.209	-.031
		.043	.309	.366	.705	.405	.903
Definite Career	Pre Survey	.391	-.115	-.192	.118	-.64	-.181
		.108	.649	.446	.640	.800	.472
	Post Survey	-.068	.277	..090	-.003	.227	-.012
		.788	.265	.721	.990	.365	.963
Travel	Pre Survey	-.049	.386	.365	-.093	-.067	-.097
		.848	.114	.136	.714	.790	.702
	Post Survey	.078	.214	.164	-.466	.168	.026
		.757	.242	.515	.052	.505	.920
Meet English-speakers	Pre Survey	.075	.065	.157	-.190	.290	-.191
		.767	.797	.534	.451	.244	.449
	Post Survey	.076	.038	.213	-.205	-.184	-.176
		.763	.882	.396	.415	.466	.485
Interact English-speakers in U.S.	Pre Survey	.297	.322	.296	-.171	.180	-.167
		.231	.192	.232	.497	.474	.507
	Post Survey	-.190	.326	.280	-.124	-.228	-.053
		.449	.187	.260	.625	.363	.834
Better Educated Person	Pre Survey	.624**	.696**	.663*	.095	-.225	-.008
		.006	.001	.003	.709	.369	.974
	Post Survey	.172	-.173	-.154	.219	-.007	-.198
		.494	.492	.541	.383	.978	.431
Gain Respect	Pre Survey	.035	.468	.506*	.214	.009	.435
		.891	.050	.032	.393	.971	.071
	Post Survey	.185	.175	.070	.491*	.167	.445
		.463	.487	.783	.039	.507	.064
Possible Future Career	Pre Survey	.235	-.274	-.287	-.184	-.139	-.239
		.348	.270	.248	.466	.583	.339
	Post Survey	.150	.085	.116	-.202	-.107	.008
		.553	.739	.646	.421	.671	.976
Like Language Learning	Pre Survey	-.097	.516*	.526*	-.111	.014	-.231
		.703	.029	.025	.660	.956	.356
	Post Survey	.110	.293	.246	-.063	.205	.114
		.663	.239	.325	.805	.416	.652
Continue Interact in Home Country	Pre Survey	.052	.428	.453	-.141	.176	.367
		.838	.076	.059	.576	.484	.135
	Post Survey	.000	.270	.272	-.346	.151	.148
		1.000	.279	.275	.160	.550	.557

Note. *Correlation is significant at the .05 level (2-tailed).

**Correlation is significant at the .01 level (2-tailed).

Table 43

Pearson Correlation and Spearman Rank Correlation Coefficient (rho): Correlations between Post Survey Attitudes toward CALL and the Post Motivations

Post Survey Motivation	Post Survey Attitudes toward CALL					
	Benefit (rho)	Interest	Enjoy	Difficult (rho)	Un-comfort.	No Computer (rho)
Course Requirement	-.259 .300	.000 1.000	-.251 .315	-.030 .905	-.084 .741	-.098 .698
Definite Career	.207 .409	.115 .649	.045 .860	.264 .290	-.254 .309	-.685** .002
Traveling (rho)	.276 .267	.336 .173	.430 .075	-.366 .135	-.440 .068	-.316 .201
Meet English-speakers	.197 .434	.383 .117	.380 .120	-.209 .406	-.420 .083	-.063 .804
Interact w/ English-speakers	.251 .315	.082 .745	-.080 .751	.241 .336	-.290 .243	-.580* .012
Better Educated Person	.192 .445	.217 .387	.148 .557	-.134 .595	-.135 .593	.051 .841
Gain Respect	.181 .473	.120 .636	.196 .437	.388 .112	-.296 .233	-.255 .306
Possible Future Career	.122 .631	.157 .535	.155 .538	-.020 .936	-.204 .417	-.265 .288
Like Language Learning	.168 .505	.302 .224	.433 .072	-.078 .760	-.273 .274	-.263 .291
Continue Interactions	.054 .832	.267 .285	.160 .527	-.077 .762	-.302 .224	-.266 .286

Note. *Correlation is significant at the .05 level (2-tailed).

**Correlation is significant at the .01 level (2-tailed).

Correlations between Demographics and the Pre-Post Survey Attitudes toward Computer Assisted Language Learning

As seen in Table 44, the results indicated that there was no significant correlation between participants' years of aviation training experience and their pre-post survey attitudes toward with Computer Assisted Language Learning (CALL). There was no significant correlation between participants' ages and their pre-post survey attitudes toward CALL. In addition, there was no significant correlation between participants' years of prior experience studying English and the pre survey attitudes toward CALL. On the other hand, results indicated that there was a significant negative correlation between participants' years of prior experience studying English and the post survey attitude of "difficult" (r_s = -.704, p < .01).

Moreover, there was a significant negative correlation between years of prior experience in working with computers for language learning purposes and the post survey attitude of "difficult" (r_s = -.564, p < .05). In addition, results indicated that there was no significant correlation between participants' years of prior experience in working with computers for language learning purposes and the pre survey attitudes toward CALL.

Table 44

Pearson Correlation and Spearman Rank Correlation Coefficient (rho): Correlations between Demographics and Pre-Post Survey Attitudes toward CALL

Attitudes toward CALL	Aviation Training	Study English	Work w/ Computer	Age (rho)
Pre Survey				
Beneficial (rho)	.331	.269	.364	.298
Sig. (2-tailed)	.179	.280	.138	.230
Interesting	.062	.334	.280	-.212
Sig. (2-tailed)	.806	.175	.260	.398
Enjoyable	.074	.318	.341	-.067
Sig. (2-tailed)	.771	.198	.166	.793
Difficult	.215	-.246	-.160	.347
Sig. (2-tailed)	.391	.325	.526	.158
Uncomfortable	.055	-.324	-.212	.077
Sig. (2-tailed)	.830	.190	.398	.761
No Computer	-.183	-.310	-.268	.231
Sig. (2-tailed)	.467	.210	.282	.356
Post Survey				
Beneficial (rho)	-.095	.208	.204	-.028
Sig. (2-tailed)	.708	.408	.417	.911
Interesting	.246	.049	.348	-.084
Sig. (2-tailed)	.325	.846	.157	.739
Enjoyable	.042	.098	.306	-.167
Sig. (2-tailed)	.867	.698	.217	.507
Difficult (rho)	-.272	-.704**	-.564*	-.217
Sig. (2-tailed)	.275	.001	.015	.387
Uncomfortable	-.191	-.247	-.439	-.195
Sig. (2-tailed)	.448	.324	.069	.439
No Computer (rho)	.428	.182	.196	.336
Sig. (2-tailed)	.077	.469	.436	.173

Note. *Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

Comparison of Groups' Test Scores in the Pre-Post Survey Attitudes toward Computer Assisted Language Learning

Participants' responses to the items of attitudes toward learning English with CALL on the pre and post surveys were aggregated and converted into two groups (disagree and agree). The study attempted to aggregate and convert the responses of 1 (strongly disagree) and 2 (disagree) on the Likert scale into one group who disagreed with the pre-post survey statements; 4 (agree) and 5 (strongly agree) on the Likert scale into the other group who agreed with the statements. The ANOVA analyses were not performed on the following pre survey attitudes toward CALL: "beneficial", "difficult", "uncomfortable", and "prefer no computer." The results of the aggregations of the variables were not successful, in that only one participant in one group either disagreed or agreed with each variable.

Similar to the pre survey attitudes toward CALL, ANOVA analyses were not performed on the following post survey attitudes toward CALL: "beneficial", "interesting", "uncomfortable", and "prefer no computer." Results of the aggregations of the above variables were not successful, in that only one participant in one group either disagreed or agreed with each variable.

As seen in Table 45, on the pre survey attitude of "interesting", there was a significant difference ($F = 5.238, p < .05$) between the disagreed group ($M = 6.00$, $SD = .000$) and the agreed group ($M = 11.92$, $SD = 3.546$) on the pretest grammar scores. Results indicated that there was a significant difference ($F = 4.948, p < .05$) between the disagreed group ($M = 40.50$, $SD = .707$) and the agreed group ($M = 59.77$, $SD = 11.868$) on the pretest total scores. In addition, there was a significant difference ($F = 25.296, p <$

.01) between the disagreed group ($M = 10.50$, $SD = .707$) and the agreed group ($M = 1.31$, $SD = 2.496$) on the grammar score gains. There was a significant difference ($F = 7.748$, $p < 05$) between the disagreed group ($M = 39.00$, $SD = 9.899$) and the agreed group ($M = 17.23$, $SD = 10.329$) on the total score gains. Moreover, on the pre survey attitude of "interesting", there was no significant difference between the two groups on the posttest scores.

As seen in Table 46, on the pre survey attitude of "enjoyable," there was no significant difference between the disagreed and agreed groups on posttest scores. In addition, there was a significant difference ($F = 4.931$, $p < .05$) between the disagreed group ($M = 45.50$, $SD = .707$) and the agreed group ($M = 60.33$, $SD = 12.213$) on the pretest total scores. There was a significant difference ($F = 7.404$, $p < .05$) between the disagreed group ($M = 17.00$, $SD = 2.828$) and the agreed group ($M = 8.08$, $SD = 4.400$) on the listening score gains. Moreover, there was significant difference ($F = 24.831$, $p < .01$) between the disagreed group ($M = 10.50$, $SD = .707$) and the agreed group ($M = 1.17$, $SD = 2.552$) on the grammar score gains. Furthermore, there was a significant difference ($F = 13.228$, $p < .01$) between the disagreed group ($M = 39.00$, $SD = 9.899$) and the agreed group ($M = 15.42$, $SD = 8.350$) on the total score gains.

As seen in Table 47, on the post survey attitude of "enjoyable," there was no significant difference between the disagreed and agreed groups on the posttest scores. Results indicated that there was a significant difference ($F = 10.073$, $p < .01$) between the disagreed group ($M = .00$, $SD = 1.000$) and the agreed group ($M = 3.91$, $SD = 2.023$) on the reading score gains.

As seen in Table 48, on the post survey attitude of "difficult," there was a significant difference ($F = 28.736$, $p < .01$) between the disagreed group (M = 34.14, $SD = 2.413$) and the agreed group ($M = 22.00$, $SD = 7.071$) on the posttest listening scores. Results indicated that there was a significant difference ($F = 9.572$, $p < .01$) between the disagreed group ($M = 21.93$, $SD = 2.401$) and agreed group ($M = 16.50$, $SD = .707$) on the posttest vocabulary scores. In addition, there was a significant difference ($F = 5.889$, $p < .05$) between the disagreed group ($M = 11.00$, $SD = 2.572$) and agreed group ($M = 6.00$, $SD = 4.243$) on the posttest reading scores. There was a significant difference ($F = 17.768$, $p < .01$) between the disagreed group ($M = 80.64$, $SD = 7.561$) and the agreed group ($M = 56.50$, $SD = 7.778$) on the posttest total scores. Moreover, there was a significant difference ($F = 5.790$, $p < .05$) between the disagreed group ($M = 12.29$, $SD = 5.239$) and the agreed group ($M = 3.00$, $SD = 2.828$) on the listening score gains.

Table 45

Analysis of Variance: Comparison of Disagreed (n = 2) and Agreed (n = 13) Groups in the Pre Survey Attitude of Interesting on the Test Scores

AEPE Test Scores	Group	Mean	*SD*	*F*	Sig.
Pretest					
Listening	Disagreed	16.50	3.536	3.611	.080
	Agreed	22.92	4.518		
Grammar	Disagreed	6.00	.000	5.238	.039*
	Agreed	11.92	3.546		
Vocabulary	Disagreed	13.00	1.414	3.086	.102
	Agreed	17.69	3.637		
Reading	Disagreed	5.00	2.828	.948	.348
	Agreed	7.23	3.032		
Total	Disagreed	40.50	.707	4.948	.044*
	Agreed	59.77	11.868		
Posttest					
Listening	Disagreed	33.50	6.364	.169	.687
	Agreed	31.85	5.194		
Grammar	Disagreed	16.50	.707	1.461	.248
	Agreed	13.23	3.700		
Vocabulary	Disagreed	20.50	4.950	.053	.822
	Agreed	21.00	2.614		
Reading	Disagreed	9.00	2.828	.560	.468
	Agreed	10.92	3.427		
Total	Disagreed	79.50	9.192	.082	.779
	Agreed	77.00	11.655		
Score Gain					
Listening	Disagreed	17.00	2.828	4.442	.055
	Agreed	8.92	5.188		
Grammar	Disagreed	10.50	.707	25.296	.000**
	Agreed	1.31	2.496		
Vocabulary	Disagreed	7.50	6.364	2.340	.150
	Agreed	3.31	3.276		
Reading	Disagreed	4.00	.000	.052	.823
	Agreed	3.69	1.843		
Total	Disagreed	39.00	9.899	7.748	.016*
	Agreed	17.23	10.329		

Note. *Correlation is significant at the 0.05 level (2-tailed).
**Correlation is significant at the 0.01 level (2-tailed).

Table 46

Analysis of Variance: Comparison of Disagreed (n = 2) and Agreed (n = 12) Groups in the Pre Survey Attitude of Enjoyable on the Test Scores

AEPE Test Scores	Group	Mean	*SD*	*F*	Sig.
Pretest					
Listening	Disagreed	16.50	3.536	4.155	.064
	Agreed	23.33	4.459		
Grammar	Disagreed	6.00	.000	4.677	.051
	Agreed	11.83	3.689		
Vocabulary	Disagreed	13.00	1.414	3.523	.085
	Agreed	18.00	3.618		
Reading	Disagreed	5.00	2.828	.821	.383
	Agreed	7.17	3.157		
Total	Disagreed	45.50	.707	4.931	.046*
	Agreed	60.33	12.213		
Posttest					
Listening	Disagreed	33.50	6.364	.266	.615
	Agreed	31.42	5.178		
Grammar	Disagreed	16.50	.707	1.610	.229
	Agreed	13.00	3.766		
Vocabulary	Disagreed	20.50	4.950	.013	.910
	Agreed	20.75	2.563		
Reading	Disagreed	9.00	2.828	.394	.542
	Agreed	10.58	3.343		
Total	Disagreed	79.50	9.192	.197	.665
	Agreed	75.75	11.226		
Score Gain					
Listening	Disagreed	17.00	2.828	7.404	.019*
	Agreed	8.08	4.400		
Grammar	Disagreed	10.50	.707	24.831	.000**
	Agreed	1.17	2.552		
Vocabulary	Disagreed	7.50	6.364	3.844	.074
	Agreed	2.75	2.701		
Reading	Disagreed	4.00	.000	.242	.632
	Agreed	3.42	1.621		
Total	Disagreed	39.00	9.899	13.228	.003**
	Agreed	15.42	8.350		

Note. *Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

Table 47

Analysis of Variance: Comparison of Disagreed (n = 3) and Agreed (n = 11) Groups in the Post Survey Attitude of Enjoyable on the Test Scores

AEPE Test Scores		Group	Mean	*SD*	*F*	Sig.
Posttest						
	Listening	Disagreed	29.00	10.440	3.503	.086
		Agreed	34.64	1.963		
	Grammar	Disagreed	13.33	1.155	.000	.990
		Agreed	13.36	3.802		
	Vocabulary	Disagreed	20.00	3.000	2.252	.159
		Agreed	22.09	1.921		
	Reading	Disagreed	7.33	3.786	4.095	.066
		Agreed	11.18	2.714		
	Total	Disagreed	69.67	16.653	3.299	.094
		Agreed	81.27	7.747		
Score Gain						
	Listening	Disagreed	10.33	10.693	.041	.844
		Agreed	11.18	5.231		
	Grammar	Disagreed	1.33	1.528	.189	.672
		Agreed	2.36	3.931		
	Vocabulary	Disagreed	3.67	2.517	.127	.727
		Agreed	4.55	3.984		
	Reading	Disagreed	.00	1.000	10.073	.008**
		Agreed	3.91	2.023		
	Total	Disagreed	15.33	13.650	.649	.436
		Agreed	22.00	12.506		

Note. **Correlation is significant at the 0.01 level (2-tailed).

Table 48

Analysis of Variance: Comparison of Disagreed (n = 14) and Agreed (n = 2) Groups in the Post Survey Attitude of Difficult on the Test Scores

AEPE Test Scores		Group	Mean	*SD*	*F*	Sig.
Posttest						
	Listening	Disagreed	34.14	2.413	28.736	.000**
		Agreed	22.00	7.071		
	Grammar	Disagreed	13.57	3.480	.366	.555
		Agreed	12.00	2.828		
	Vocabulary	Disagreed	21.93	2.401	9.572	.008**
		Agreed	16.50	.707		
	Reading	Disagreed	11.00	2.572	5.889	.029*
		Agreed	6.00	4.243		
	Total	Disagreed	80.64	7.561	17.768	.001**
		Agreed	56.50	7.778		
Score Gain						
	Listening	Disagreed	12.29	5.239	5.790	.031*
		Agreed	3.00	2.828		
	Grammar	Disagreed	3.00	3.922	.764	.397
		Agreed	.50	.707		
	Vocabulary	Disagreed	4.86	3.183	1.496	.242
		Agreed	2.00	1.414		
	Reading	Disagreed	3.29	2.400	1.037	.326
		Agreed	1.50	.707		
	Total	Disagreed	23.43	10.917	4.181	.060
		Agreed	7.00	5.657		

Note. *Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

Perceptions of Computer Assisted Language Learning in Facilitating Interactions

Descriptive Statistics of Pre Survey Perceptions of CALL in Facilitating Interactions

A summary of the descriptive statistics of the results of the 18 participants' pre survey responses to the question of perceptions of Computer-Assisted Language Learning (CALL) technology in facilitating interactions among students is presented in Table 49. As seen in Table 49, the mean response to the item of "CALL facilitates interactions for me personally with other ESL students in the classroom" was 3.56, and the standard deviation was 1.15, which indicated that the majority of participants reported that CALL technology facilitated interactions. That is, about 72% of the participants indicated that CALL facilitated interactions among students in the classroom, prior to the beginning of the training program (strongly agree and agree). On the other hand, only 17% of the participants indicated that CALL did not facilitate interactions in the classroom (strongly disagree and disagree).

Descriptive Statistics of Post Survey Perceptions of CALL in Facilitating Interactions

A summary of the descriptive statistics of the results of the 18 participants' post survey responses to the question of perceptions of Computer-Assisted Language Learning (CALL) technology in facilitating interactions among students is presented in Table 49. As seen in Table 49, the mean response to the post survey item of "CALL facilitates interactions for me personally with other ESL students in the classroom" was 4.0, and the standard deviation was .77, which indicated that the majority of participants reported that CALL technology facilitated interactions in the classroom, after two months of the training program.

About 83% of the participants indicated that CALL facilitated interactions among students in the classroom (strongly agree and agree). On the other hand, only 6% of the participants indicated that studying English with Computer Assisted Language Learning (CALL) did not facilitate interactions in the classroom (strongly disagree and disagree).

Table 49

Results of Pre-Post Survey Perceptions of CALL in Facilitating Interactions

CALL Facilitates Interaction in the Classroom	Mean	Min/Max	*SD*
Post Survey	4.00	1 - 5	.767
Pre Survey	3.56	1 - 5	1.149

Correlations between the Pre Survey Perceptions of CALL in Facilitating Interactions and the Test Scores

The data distribution of the pre survey perceptions of CALL in facilitating interactions was normally distributed (Skewness = -1.330, Kurtosis = 1.220). Therefore, Pearson correlation analyses were utilized to examine if correlation existed between the pre survey perceptions of CALL in facilitating interactions in studying English, the pretest-posttest scores, and score gains.

As seen in Table 50, there was a significant positive correlation between the pre survey perceptions of CALL in facilitating interactions and the pretest listening scores ($r = .548, p < .05$). The results also indicated that there was a significant positive correlation between participants' pre survey perceptions of CALL in facilitating interactions and their pretest total scores ($r = .554, p < .05$). In addition, results indicated that there was no significant correlation between pre survey perceptions of CALL in facilitating

interactions and the pretest grammar ($r = .364, p = .137$), vocabulary ($r = -.461, p = .054$), or reading ($r = .419, p = .084$) scores.

As seen in Table 50, there was no significant correlation between the pre survey perceptions of CALL in facilitating interactions and the posttest listening ($r_s = .220, p = 425$), grammar ($r = .171, p = .497$), vocabulary ($r = .370, p = .130$), or total ($r = .346, p = 159$) scores. In addition, there was a significant positive correlation between the pre survey perceptions of CALL in facilitating interactions and the posttest reading scores ($r = .515, p < .05$).

As seen in Table 50, there was no significant correlation between the pre survey perceptions of CALL in facilitating interactions and the listening ($r = -.234, p = .349$), vocabulary ($r = -.222, p = .376$), reading ($r = .126, p = .618$), or total ($r = -.317, p = .200$) score gains. Moreover, the results indicated that there was a significant negative correlation between the pre survey perceptions of CALL in facilitating interactions and the grammar score gains ($r = -.521, p < .05$).

Correlations between Post Survey Perceptions of Computer Assisted Language Learning in Facilitating Interactions and the Test Scores

The data distribution of post survey perceptions of CALL in facilitating interactions was normally distributed (Skewness = -.880, Kurtosis = 1.717). Therefore, Pearson correlation analyses were utilized to examine if correlation existed between the post survey perceptions of CALL in facilitating interactions, the posttest scores, and score gains. As seen in Table 50, results indicated that there was a significant positive correlation between the post survey perceptions of CALL in facilitating interactions and the posttest total scores ($r = .483, p < .05$).

In addition, results indicated that there was no significant correlation between the post survey perceptions of CALL in facilitating interactions and the posttest grammar (r = .274, p = .271), vocabulary (r = .280, p = .260), or reading (r = .350, p = .155) scores. Moreover, there was no significant correlation between the post survey perceptions of CALL in facilitating interactions and the listening (r = .218, p = .384), grammar (r = .380, p = .120), vocabulary (r = .195, p = .438), reading (r = .382, p = .118), or total (r = .352, p = .153) score gains.

Table 50

Pearson Correlation and Spearman Rank Correlation Coefficient (rho): Correlations between Pre-Post Survey Perceptions of CALL in Facilitating Interactions and the Test Scores

AEPE Test Scores		CALL Facilitated Interactions	
		Pre Survey	Post Survey
Pretest			
	Listening	.548*	
	Sig. (2-tailed)	.019	
	Grammar	.364	
	Sig. (2-tailed)	.137	
	Vocabulary	.461	
	Sig. (2-tailed)	.054	
	Reading	.419	
	Sig. (2-tailed)	.084	
	Total	.554*	
	Sig. (2-tailed)	.017	
Posttest			
	Listening (rho)	.220	.150
	Sig. (2-tailed)	.425	.551
	Grammar	-.171	.274
	Sig. (2-tailed)	.497	.271
	Vocabulary	.370	.280
	Sig. (2-tailed)	.130	.260
	Reading	.515*	.350
	Sig. (2-tailed)	.029	.155
	Total	.346	.483*
	Sig. (2-tailed)	.159	.042
Score Gain			
	Listening	-.234	.218
	Sig. (2-tailed)	.349	.384
	Grammar	-.521*	.380
	Sig. (2-tailed)	.027	.120
	Vocabulary	-.222	.195
	Sig. (2-tailed)	.376	.438
	Reading	.126	.382
	Sig. (2-tailed)	.618	.118
	Total	-.317	.352
	Sig. (2-tailed)	.200	.153

Note. *Correlation is significant at the 0.05 level (2-tailed)

Comparison of Groups' Test Scores in the Pre Survey Perceptions of Computer Assisted Language Learning in Facilitating Interactions

Participants' responses to pre survey item of perceptions of CALL in facilitating interactions were aggregated and converted into two groups (disagree and agree); 1 (strongly disagree) and 2 (disagree) on the Likert scale were aggregated and converted into one group who disagreed with the pre survey statement; 4 (agree) and 5 (strongly agree) on the Likert scale were also aggregated and converted into another group who agreed with the statement. Analyses of variance (ANOVA) were utilized to analyze if there was a significant difference between the two groups on their pretest-posttest scores, and score gains.

As seen in Table 51, there was a significant difference ($F = 9.075, p < .01$) between the disagreed group ($M = 16.33$, $SD = 2.517$) and the agreed group ($M = 24.38$, $SD = 4.388$) on the pretest listening scores. Results indicated that there was no significant difference ($F = 2.276, p = .154$) between the two groups on the pretest grammar scores. Moreover, there was a significant difference ($F = 4.612, p < .05$) between the disagreed group ($M = 14.00$, $SD = 2.000$) and the agreed group ($M = 18.77$, $SD = 3.655$) on the pretest vocabulary scores. There was a significant difference ($F = 5.344, p < .05$) between the disagreed group ($M = 4.00$, $SD = 2.646$) and the agreed group ($M = 8.23$, $SD = 2.891$) on the pretest reading scores. In addition, there was a significant difference ($F = 8.155, p < .05$) between the disagreed group ($M = 43.00$, $SD = 4.359$) and the agreed group ($M = 63.54$, $SD = 11.997$) on the pretest total scores.

Furthermore, there was no significant difference between the two groups on their posttest listening ($F = 4.387, p = .055$), grammar ($F = .814, p = .382$), vocabulary ($F =$

3.555, $p = .080$), or total ($F = 3.577$, $p = .079$) scores. In addition, results indicated that there was a significant difference ($F = 7.456$, $p < .05$) between the disagreed group ($M = 7.00$, $SD = 4.000$) and the agreed group ($M = 11.69$, $SD = 2.394$) on the posttest reading scores. There was a significant difference ($F = 6.821$, $p < .05$) between the disagreed group ($M = 7.00$, $SD = 6.083$) and the agreed group ($M = 1.54$, $SD = 2.504$) on the grammar score gains. There was no significant difference between the two groups on their listening ($F = .361$, $p = .557$), vocabulary ($F = .655$, $p = .432$), reading ($F = .115$, $p = .740$), or total ($F = 1.362$, $p = .263$) score gains.

Comparison of Groups' Test Scores in the Post Survey Perceptions of Computer Assisted Language Learning in Facilitating Interactions

Participants' responses to the post survey item of perceptions of CALL in facilitating interactions were aggregated and converted into two groups (disagree and agree). The study attempted to aggregate and convert the responses of 1 (strongly disagree) and 2 (disagree) on the Likert scale into one group who disagreed with the post survey statement; 4 (agree) and 5 (strongly agree) on the Likert scale into another group who agreed with the statement. However, the results of the conversions were not successful, in that only 1 participant was in the disagreed group and 15 participants in the agreed group. Therefore, the Analysis of variance (ANOVA) analysis was not performed.

Table 51

Analysis of Variance: Comparison of Disagreed (n = 3) and Agreed (n = 13) Groups in the Pre Survey Perceptions of CALL in Facilitating Interactions on the Test Scores

AEPE Test Scores	Group	Mean	*SD*	*F*	Sig.
Pretest					
Listening	Disagreed	16.33	2.517	9.075	.009**
	Agreed	24.38	4.388		
Grammar	Disagreed	8.67	4.619	2.276	.154
	Agreed	12.15	3.412		
Vocabulary	Disagreed	14.00	2.000	4.612	.050*
	Agreed	18.77	3.655		
Reading	Disagreed	4.00	2.646	5.344	.037*
	Agreed	8.23	2.891		
Total	Disagreed	43.00	4.359	8.155	.013*
	Agreed	63.54	11.997		
Posttest					
Listening	Disagreed	28.00	10.536	4.387	.055
	Agreed	33.92	2.060		
Grammar	Disagreed	15.67	1.528	.814	.382
	Agreed	13.69	3.637		
Vocabulary	Disagreed	19.33	4.041	3.555	.080
	Agreed	22.15	1.908		
Reading	Disagreed	7.00	4.000	7.456	.016*
	Agreed	11.69	2.394		
Total	Disagreed	70.00	17.692	3.577	.079
	Agreed	81.46	7.230		
Score Gain					
Listening	Disagreed	11.67	9.452	.361	.557
	Agreed	9.54	4.557		
Grammar	Disagreed	7.00	6.083	6.821	.021*
	Agreed	1.54	2.504		
Vocabulary	Disagreed	5.33	5.859	.655	.432
	Agreed	3.38	3.280		
Reading	Disagreed	3.00	1.732	.115	.740
	Agreed	3.46	2.184		
Total	Disagreed	27.00	21.932	1.362	.263
	Agreed	17.92	9.587		

Note. *Correlation is significant at the 0.05 level (2-tailed).

**Correlation is significant at the 0.01 level (2-tailed).

Correlations between Demographics and the Pre Survey Perceptions of CALL in Facilitating Interactions

The data distribution of the variable of participants' pre survey perceptions of Computer Assisted Language Learning (CALL) in facilitating interactions was normally distributed (Skewness = -1.330, Kurtosis = 1.220). Therefore, Pearson correlation analyses were utilized to analyze if a significant correlation existed between participants' pre survey perceptions of CALL in facilitating interactions and participants' years of aviation training experience, years of experience studying English, and years of experience in working with computers for language learning purposes.

As seen in Table 52, results indicated that there was no significant correlation between participants' years of aviation training experience and their pre survey perceptions of CALL in facilitating interaction ($r = .310, p = .211$). On the other hand, results indicated that there was a significant positive correlation between participants' years of experience studying English and the pre survey perceptions of CALL in facilitating interactions ($r = .600, p < .01$). Furthermore, there was no significant correlation between participants' prior years of experience in working with computers for language learning purposes and the pre survey perceptions of CALL in facilitating interactions ($r = .432, p = .073$).

Moreover, Spearman correlation coefficient analysis was utilized to analyze if a significant correlation existed between participants' pre survey perceptions of CALL in facilitating interactions and their ages. As seen in Table 52, there was no significant correlation between participants' ages and their pre perceptions of CALL in facilitating interactions ($r_s = .237, p = .345$).

Correlations between Demographics and the Post Survey Perceptions of CALL in Facilitating Interactions

The data distribution of the variable of the post survey perceptions of Computer Assisted Language Learning (CALL) in facilitating interactions was normally distributed (Skewness = -.880, Kurtosis = 1.717). Therefore, Pearson correlation analyses were utilized to analyze if a significant correlation existed between the post survey perceptions of CALL in facilitating interactions and participants' years of aviation training experience, years of experience studying English, and years of experience in working with computers for language learning purposes.

As seen in Table 52, there was no significant correlation between participants' years of aviation training experience and the post survey perceptions of CALL in facilitating interaction ($r = .194, p = .440$). Results indicated that there was no significant correlation between participants' years of prior experience studying English and the post survey perceptions of CALL in facilitating interactions ($r = -.332, p = .179$). Moreover, there was no significant correlation between the participants' prior years of experience in working with computers for language learning purposes and the post survey perceptions of CALL in facilitating interactions ($r = .000, p = 1.000$).

Furthermore, Spearman correlation coefficient analysis was utilized to analyze if there was a significant correlation between participants' post survey perceptions of CALL in facilitating interactions and their ages. As seen in Table 52, there was no significant correlation between participants' ages and their post survey perceptions of CALL in facilitating interactions ($r_s = .136, p = .590$).

Table 52

Pearson Correlation and Spearman Rank Correlation Coefficient (rho): Correlations between Pre-Post Survey Perceptions of CALL in Facilitating Interactions and the Demographics

CALL Facilitated Interactions	Aviation Training	Study English	Work w/ Computer	Age (rho)
Pre Survey	.310	.600**	.432	.237
Sig. (2-tailed)	.211	.008	.073	.345
Post Survey	.194	-.332	.000	.136
Sig. (2-tailed)	.440	.179	1.000	.590

Note. ** Correlation is significant at the 0.01 level (2-tailed).

Correlations between Pre Survey Attitudes toward CALL in Facilitating Interactions and the Pre-Post Survey Attitudes toward CALL

Pearson correlation analyses were utilized to examine if correlation existed between participants' pre survey perceptions of CALL in facilitating interactions and their attitudes toward CALL (interesting, enjoyable, difficult, and uncomfortable). Spearman rank correlation coefficient analyses were utilized to examine if correlation existed between the pre survey perceptions of CALL in facilitating interactions and their attitudes toward CALL (beneficial and prefer no computer).

As seen in Table 53, there was no significant correlation between the pre survey perceptions of CALL in facilitating interactions and the pre survey attitudes of "beneficial" ($r_s = .274, p = .272$), "difficult" ($r = -.110, p = .664$), "uncomfortable" ($r = -.278, p = .265$), or "prefer no computer" ($r_s = -.187, p = .457$). In addition, results indicated that there was a significant positive correlation between the pre survey

perceptions of CALL in facilitating interactions and the pre survey attitude of "interesting" ($r = .735, p < .01$). There was a significant positive correlation between the pre survey perceptions of CALL in facilitating interactions and the pre survey attitude of "enjoyable" ($r = .691, p < .01$).

There was no significant correlation between the pre survey perceptions of CALL in facilitating interactions and the post survey attitudes of "enjoyable" ($r = .418, p = .084$), or "difficult" ($r_s = -.425, p = .079$). There were significant positive correlations between the pre survey perceptions of CALL in facilitating interactions and the post survey attitudes of "beneficial" ($r_s = .491, p < .05$), and "interesting" ($r = .498, p < .05$). In addition, there was a significant negative correlation between pre survey perceptions of CALL in facilitating interactions and the post survey attitude of "uncomfortable" ($r = -.615, p < .01$).

Correlations between Post Survey Perceptions of CALL in Facilitating Interactions and the Pre-Post Survey Attitudes toward CALL

Pearson correlation analyses were utilized to examine if correlation existed between participants' post survey perceptions of CALL in facilitating interactions and the pre survey attitudes toward CALL (interesting, enjoyable, difficult, and uncomfortable) and the post survey attitudes toward CALL (interesting, enjoyable, and uncomfortable). Spearman rank correlation coefficient analyses were utilized to examine if correlation existed between the post survey perceptions of CALL in facilitating interactions and the pre survey attitudes toward CALL (beneficial and prefer no computer) and the post survey attitudes toward CALL (beneficial, difficult, and prefer no computer). As seen in Table 53, there was no significant correlation between the post survey perceptions of

CALL in facilitating interactions and the post survey attitudes of "beneficial" ($r_s = .172, p = .496$), "difficult" ($r_s = -.130, p = .606$), or "prefer no computer" ($r_s = -.183, p = .468$).

Moreover, results indicated that there was a significant positive correlation between the post survey perceptions of CALL in facilitating interactions and the post survey attitude of "interesting" ($r = .626, p < .01$). There was a significant positive correlation between the post survey perceptions of CALL in facilitating interactions and the post survey attitude of "enjoyable" ($r = .500, p < .05$). In addition, there was a significant negative correlation between the post survey perceptions of CALL in facilitating interactions and the post survey attitude of "uncomfortable" ($r = -.506, p < .05$). Finally, results indicated that there was no significant correlation between the post survey perceptions of CALL in facilitating interactions and the pre survey attitudes toward CALL.

Table 53

Pearson Correlations and Spearman Rank Correlation Coefficient (rho): Correlations between Pre-Post Survey Attitudes toward CALL and the Pre-Post Perceptions of CALL in Facilitating Interactions

Attitudes toward CALL	CALL Facilitated Interactions	
	Pre Survey	Post Survey
Pre Survey		
Beneficial (rho)	.274	.025
Sig. (2-tailed)	.272	.922
Interesting	.735**	-.072
Sig. (2-tailed)	.001	.775
Enjoyable	.691**	-.091
Sig. (2-tailed)	.002	.719
Difficult	-.110	-.093
Sig. (2-tailed)	.664	.714
Uncomfortable	-.278	.405
Sig. (2-tailed)	.265	.096
Prefer No Computer (rho)	-.187	.167
Sig. (2-tailed)	.457	.507
Post Survey		
Beneficial (rho)	.491*	.172
Sig. (2-tailed)	.039	.496
Interesting	.498*	.626**
Sig. (2-tailed)	.036	.005
Enjoyable	.418	.500*
Sig. (2-tailed)	.084	.035
Difficult (rho)	-.425	-.130
Sig. (2-tailed)	.079	.606
Uncomfortable	-.615**	-.506*
Sig. (2-tailed)	.007	.032
Prefer No Computer (rho)	-.224	-.183
Sig. (2-tailed)	.372	.468

Note. * Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

Comparison between Pre and Post Survey Perceptions of CALL in Facilitating Interactions

Paired-samples *t* tests were utilized to analyze if there was a significant difference between participants' pre survey (Skewness = -1.330, Kurtosis = 1.220) and post survey (Skewness = -.880, Kurtosis = 1.717) perceptions of CALL in facilitating interactions. As seen in Table 54, results indicated that there was no significant difference ($t = -1.458$, $p = .163$) between the pre survey perceptions of CALL in facilitating interactions ($M = 3.56$, $SD = .271$) and the post survey results ($M = 4.00$, $SD = .181$).

Table 54

Paired-Samples t Tests: Comparison of Pre and Post Survey Perceptions of CALL in Facilitating Interactions

CALL in Facilitating Interactions	Paired Differences Mean	Paired Differences *SD*	*t*	*df*	Sig. (2-tailed)
Pretest – Posttest	-.44	1.294	-1.458	17	.163

Confounding Variables

Descriptive Statistics of Pre Survey Confounding Variables

A summary of the descriptive statistics of the results of the pre survey confounding variables (amount of time students interacted with native English-speakers, amount of time students watched TV and movies, and the amount of time students communicated with other ESL students in English) is presented in Table 55. As seen in Table 55, the mean number of hours students interacted with native English-speakers prior to the beginning of the training program was .19 hour per week, and the standard

deviation was .572, which indicated that the participants did not spend much of their time interacting with native English-speakers prior to the beginning of the training program. That is, about 89% of the participants spent 0 hours per week interacting with native English-speakers.

The mean number of hours students watched TV and movies prior to the beginning of the training program was .06 hour per week, and the standard deviation was .236, which indicated that the participants did not spend much of their time watching TV or movies prior to the beginning of the training program. About 94% of the participants spent 0 hours per week watching TV or movies.

The mean number of hours students communicated with other ESL students in English prior to the beginning of the training program was .06 hour per week, and the standard deviation was .236, which indicated that the participants did not spend much of their time communicating with other ESL students in English prior to the beginning of the training program. About 94% of the participants spent 0 hours per week communicating with other ESL students in English.

Descriptive Statistics of Post Survey Confounding Variables

A summary of the descriptive statistics of the results of the post survey confounding variables (amount of time students interacted with native English-speakers, amount of time students watched TV and movies, and the amount of time students communicated with other ESL students in English) is presented in Table 55. As seen in Table 55, the mean number of hours students interacted with native English-speakers was 13.17 hours per week, and the standard deviation was 11.06, which indicated varied amounts of time that the participants interacted with native English-speakers during two

months of the training program. A majority of the participants (67%) spent 10 hours or less per week of their time interacting with native English-speakers. In addition, only one participant spent 42 hours per week interacting with native English-speakers during two months of the training program.

The mean number of hours students watched TV and movies was 8.33 hours per week, and the standard deviation was 4.79, which indicated varied amounts of time the participants watched TV and movies during two months of the blended learning aviation English training program. About 94% of the participants spent 10 hours or less per week of their time watching TV and movies.

The mean number of hours students communicated with other ESL students in English was 6.44 hours per week, and the standard deviation was 4.96, which indicated varied amounts of time that the participants communicated with other ESL students in English during two months of the training program. That is, about 89% of the participants spent 10 hours or less per week of their time communicating with other ESL students in English, during two months of the aviation English training program.

Table 55

Results of Pre-Post Survey Confounding Variables

Confounding Variables		Mean	Min/Max	*SD*
Interact w/ Native English-speakers	Pre Survey	.19	0 - 2	.572
	Post Survey	13.17	2 - 42	11.06
Watch TV and Movies	Pre Survey	.06	0 - 1	.236
	Post Survey	8.33	2 - 21	4.79
Communicate with Other ESL Students in English	Pre Survey	.06	0 - 1	.236
	Post Survey	6.44	0 - 20	4.96

Correlations between Pre Survey Confounding Variables and the Test Scores

The data distributions of pre survey confounding variables of average hours per week that the participants interacted with native English-speakers (Skewness = 2.821, Kurtosis = 1.038), watched TV and movies (Skewness = 4.243, Kurtosis = 18.000), and communicated with other students in English (Skewness = 4.243, Kurtosis = 18.000) were not normally distributed. Therefore, Spearman rank correlation coefficient analyses were utilized to examine if correlation existed between the pre survey confounding variables, the pretest-posttest scores, and score gains.

As seen in Table 56, there was a significant positive correlation between the pre survey amount of time participants interacted with native English-speakers prior to the beginning of the training program and the pretest grammar scores ($r_s = .485, p < .05$). In addition, there was no significant correlation between the pre survey amount of time participants interacted with native English-speakers and the pretest listening ($r_s = .402, p = .098$), vocabulary ($r_s = .424, p = .079$), reading ($r_s = .227, p = .365$), or total ($r_s = .429, p = .076$) scores.

Moreover, there was no significant correlation between pre survey amount of time participants interacted with native English-speakers and the posttest scores. On the other hand, there were significant negative correlations between the pre survey amount of time participants interacted with native English-speakers and the listening ($r_s = -.478, p < .05$), vocabulary ($r_s = -.546, p < .05$), and the total ($r_s = -.479, p < .05$) score gains. Furthermore, there was no significant correlation between the pre survey amount of time participants watched TV and movies and their pretest-posttest scores, and score gains. In addition, results indicated that there was no significant correlation between the pre survey

amount of time participants communicated with other students in English, their pretest-posttest scores, and score gains.

Correlations between Post Survey Confounding Variables and the Test Scores

The data distributions of the post survey confounding variables of average hours per week that the participants interacted with native English-speakers (Skewness = 1.366, Kurtosis = 1.424), watched TV and movies (Skewness = .907, Kurtosis = 1.687), and communicated with other students in English (Skewness = 1.151, Kurtosis = 1.798) were normally distributed. Pearson correlation analyses were utilized to examine if correlation existed between the three post survey confounding variables, the posttest scores, and score gains. In addition, Spearman rank correlation coefficient analyses were utilized to examine if correlation existed between the three post survey confounding variables and the posttest listening scores.

As seen in Table 56, there was no significant correlation between the post survey confounding variable of amount of time participants interacted with native English-speakers and the posttest listening (r_s = .204, p = .418), grammar (r = -.256, p = .306), vocabulary (r = -.085, p = .738), reading (r = .045, p = .860), or total (r = -.058, p = .820) scores. There was no significant correlation between the post survey confounding variable of amount of time participants watched TV and movies and the posttest listening (r_s = .055, p = .829), grammar (r = -.100, p = .693), vocabulary (r = -.122, p = .629), reading (r = -.267, p = .284), or total (r = -.168, p = .505) scores.

Moreover, there was no significant correlation between the post survey confounding variable of amount of time participants communicated with other students in English and the posttest listening (r_s = -.263, p = .292), grammar (r = -.314, p = .205),

vocabulary (r = -.442, p = .066), reading (r = -.133, p = .598), or total (r = -.455, p = .058) scores. In addition, there was no significant correlation between the post survey variables (amount of time interacted with native English-speakers, amount of time watched TV and movies, and amount of time communicated with other students in English) and the score gains.

Table 56

Pearson Correlation and Spearman Rank Correlation Coefficient: Correlations between Pre-Post Survey Confounding Variables and the Test Scores

AEPE Test Scores		Average Hours/Week					
		Interact w/ English-speakers		Watch TV and Movies		Communicate in English	
		Pre (rho)	Post	Pre (rho)	Post	Pre (rho)	Post
Pretest	Listening	.402		.141		.141	
	Sig.	.098		.578		.578	
	Grammar	.485*		.283		.283	
	Sig.	.042		.255		.255	
	Vocabulary	.424		.329		.329	
	Sig.	.079		.183		.183	
	Reading	.227		.094		.094	
	Sig.	.365		.710		.710	
	Total	.429		.258		.258	
	Sig.	.076		.302		.302	
Posttest	Listening	-.160	.204	-.258	.055	-.258	-.263
	Sig. (rho)	.527	.418	.300	.829	.300	.292
	Grammar	.314	-.256	.404	-.100	.404	-.314
	Sig.	.204	.306	.096	.693	.096	.205
	Vocabulary	.000	-.085	.000	-.122	.000	-.442
	Sig.	1.000	.738	1.000	.629	1.000	.066
	Reading	.233	.045	.024	-.267	.024	-.133
	Sig.	.351	.860	.926	.284	.926	.598
	Total	.110	-.058	-.023	-.168	-.023	-.455
	Sig.	.664	.820	.926	.505	.926	.058
Score Gain	Listening	-.478*	.183	-.328	.152	-.328	-.146
	Sig.	.045	.468	.184	.547	.184	.562
	Grammar	-.189	-.021	.094	.250	.094	-.356
	Sig.	.452	.933	.709	.317	.709	.148
	Vocabulary	-.546*	-.037	-.400	.208	-.400	-.110
	Sig.	.019	.885	.100	.407	.100	.665
	Reading	-.005	.065	-.167	.204	-.167	.449
	Sig.	.985	.799	.507	.417	.507	.062
	Total	-.479*	.085	-.304	.250	-.304	-.130
	Sig.	.045	.736	.220	.316	.220	.607

Note. *Correlation is significant at the 0.05 level (2-tailed).

Comparison between Pre and Post Survey Confounding Variables

Wilcoxon matched-pairs signed-ranks test was utilized to examine if a significant difference existed between the pre and post survey confounding variables. As seen in Table 57, results indicated that there was a significant difference ($z = -3.632$, $p < .01$) between the pre survey variable of amount of time participants interacted with native English-speakers ($M = .19$, $SD = .572$) and the post survey results ($M = 13.17$, $SD = 11.06$). Moreover, there was a significant difference ($z = -3.735$, $p < .01$) between the pre survey variable of amount of time participants watched TV and movies ($M = .06$, $SD = .236$) and the post survey results ($M = 8.33$, $SD = 4.79$). In addition, there was a significant difference ($z = -3.630$, $p < .01$) between the pre survey variable of amount of time participants communicated with other students in English ($M = .06$, $SD = .236$) and the post survey results ($M = 6.44$, $SD = 4.96$).

Table 57

Wilcoxon Matched-Pairs Signed-Ranks Test: Post and Pre Survey of Confounding Variables

Confounding Variables (Posttest – Pretest)	*z*	Sig. (2-tailed)
Interact W/ Native English-speakers	-3.632	.000**
Watch TV and Movies	-3.735	.000**
Communicate W/ Other Students in English	-3.630	.000**

Note. **Correlation is significant at the 0.05 level (2-tailed).

Correlations between Pre-Post Survey Confounding Variables and Demographics

The Spearman rank correlation coefficient analyses were utilized to examine if correlation existed between the pre survey confounding variables and the demographics. As seen in Table 58, there was no significant correlation between the pre survey confounding variables (amount of time interacted with native English-speakers, amount of time watched TV and movies, and the amount of time communicated with other students in English) and the demographics (ages, years of aviation training, years of experience studying English, and years of prior experience worked with computers for language learning purposes).

Pearson correlation analyses were utilized to examine the post survey confounding variables (amount of time interacted with native English-speakers, amount of time watched TV and movies, and the amount of time communicated with other students in English) and the demographics (years of aviation training experience, years of experience studying English, and years of prior experience worked with computers for language learning purposes). The Spearman rank correlation coefficient analyses were utilized to examine the post survey confounding variables and participants' ages.

As seen in Table 58, results indicated that there was no significant correlation between participants' years of aviation training experience and the post survey confounding variables. Moreover, there was no significant correlation between participants' years of experience studying English and the post survey confounding variables. On the other hand, there was a significant positive correlation between participants' years of prior experience working with computers for language learning purposes and the post survey amount of time watching TV and movies ($r = .504$, $p < .05$).

As seen in Table 58, there was no significant correlation between participants' ages and the post survey confounding variables.

Table 58

Pearson Correlation and Spearman Rank Correlation Coefficient (rho): Correlations between Pre-Post Survey Confounding Variables and the Demographics

Confounding Variables		Demographics			
		Age (rho)	Aviation Training	Studying English	Work with Computer
Interact with Native English-Speakers	Pre Survey (rho)	-.114 .653	.156 .538	-.387 .112	.007 .979
	Post Survey	.226 .367	.339 .169	.466 .052	.358 .145
Watch TV and Movies	Pre Survey (rho)	.134 .596	-.049 .846	-.266 -.286	-.312 .207
	Post Survey	-.018 .943	.158 .531	.091 .719	.504* .033
Communicate in English	Pre Survey (rho)	.134 .596	-.049 .846	-.266 .286	-.312 .207
	Post Survey	-.048 .849	-.349 .155	.003 .990	-.288 .246

Note. *Correlation is significant at the .05 level (2-tailed)

Explanation and Discussion of Results

Discussion of Results of Research Question 1

Research Question 1: To what extent is there a significant difference between the pretest and the posttest scores of students who are enrolled in the English for Specific Purposes (ESP) training program implemented with the online learning Computer-Assisted Language Learning (CALL) technology blended with an instructor in the classroom (blended learning)?

The results of the paired-samples t test analysis indicated that for the 18 subjects, there was a significant difference ($t = 6.973, p < .01$) between the posttest total scores ($M = 78.11$, $SD = 10.476$) and the pretest total scores ($M = 58.39$, $SD = 13.404$). The results indicated that after two months of the implementation of the Computer-Assisted Language Learning (CALL) technology blended with an instructor (blended learning) in the Aviation English training program, the 18 participants had significant improvement on their Aviation English Placement Exam test scores. On average, participants' total test scores were 19.72% higher than their pretest total scores and the difference was statistically significant at $p < .01$ level.

Results of Hypothesis 1 Testing

The results of the analysis indicated that the first hypothesis of this study was to be rejected, which hypothesized that there would be no significant difference between the pretest and posttest scores of the students who are enrolled in the blended learning English for Specific Purposes (ESP) training program.

Discussion of Results of Research Question 2

Research Question 2: To what extent is there a significant difference between the pretest and the posttest scores of students who are enrolled in the blended learning ESP training program in the areas of listening, reading, vocabulary, and grammar components of the test?

The results of the Wilcoxon matched-pairs signed-ranks analysis indicated that there was a significant difference ($z = -3.762, p < .01$) between the pretest listening scores ($M = 22.22$, $SD = 5.494$) and posttest listening scores ($M = 32.56$, $SD = 4.805$). Out of the total of 40 points of listening scores, participants' posttest listening scores on average was

10.33 points or 25.8% higher than their pretest listening scores. That is, after two months of the blended learning aviation English training program, participants had about 26% improvement on their listening scores and the improvement was statistically significant at $p < .01$ level.

The results of the paired-samples t tests analysis indicated that there was a significant difference ($t = 2.919$, $p < .01$) between the posttest grammar scores ($M = 13.72$, $SD = 3.357$) and the pretest grammar scores ($M = 11.22$, $SD = 2.623$). Our of the total of 20 points of grammar scores, participants' posttest grammar scores on average was 2.5 points or 12.5% higher than their pretest grammar scores. That is, after two months of the blended learning aviation English training program, participants had more than 12% improvement on their grammar scores and the improvement was statistically significant at $p < .01$ level. .

The results of the paired-samples t tests analysis indicated that there was a significant difference ($t = 4.600$, $p < .01$) between the posttest vocabulary scores ($M = 21.22$, $SD = 2.734$) and the pretest vocabulary scores ($M = 17.39$, $SD = 3.898$). Out of the total of 25 points of vocabulary scores, participants' posttest vocabulary scores on average was 3.38 points or 13.5% higher than their pretest vocabulary scores. After two months of the blended learning aviation English training program, participants had more than 13% improvement on their vocabulary scores and the improvement was statistically significant at $p < .01$ level.

The results of paired-samples t test indicated that there was a significant difference ($t = 5.869$, $p < .01$) between the posttest reading scores ($M = 10.61$, $SD = 3.071$) and the pretest reading scores ($M = 7.56$, $SD = 3.110$). Out of the total of 15 points

of reading scores, participants' posttest reading scores on average was 3.06 points or 20.4% higher than their pretest reading scores. After two months of the blended learning aviation English training program, participants had more than 20% improvement on their vocabulary scores and the improvement was statistically significant at $p < .01$ level.

Results of Hypothesis 2 Testing

The results indicated that there were significant differences between the pretest and posttest scores in the areas of listening, grammar, vocabulary, and reading scores. Hence, the results of the analyses suggested that hypothesis 2 of this study was to be rejected, which hypothesized that there would be no significant difference between pretest and posttest scores of students who were enrolled in the blended learning ESP training program in the areas of listening, reading, vocabulary, and grammar components of the tests.

Correlation Analyses on Pretest Scores

Additional correlation analyses were performed to examine if a significant correlation existed in each section (listening, grammar, vocabulary, and reading) of the AEPE and the pretest-posttest total scores. The results indicated that there were significant positive correlations between the pretest total scores and the pretest listening ($r = .844, p < .01$), grammar ($r = .781, p < .01$), vocabulary ($r = .922, p < .01$), or reading ($r = .754, p < .01$) scores. The results indicated that there was a significant positive correlation between the pretest listening and pretest vocabulary scores ($r = .658, p < .01$) and a significant positive correlation between the pretest listening and the pretest reading scores ($r = .553, p < .05$).

Moreover, the results indicated that there was a significant positive correlation between the pretest vocabulary and pretest grammar scores ($r = .814, p < .01$) and a significant positive correlation between the pretest vocabulary and pretest reading scores ($r = .612, p < .01$). The results of the correlation analyses indicated that there was no significant correlation between the pretest grammar scores and pretest listening scores ($r = .423, p = .080$) or the pretest reading scores ($r = .432, p = .073$).

Correlation Analyses on Posttest Scores

Similar to the pretest scores on AEPE, the results indicated that there were significant positive correlations between the posttest total scores and posttest listening ($r_s = .622, p < .01$), posttest grammar ($r = .550, p < .05$), posttest vocabulary ($r = .870, p < .01$), and the posttest reading ($r = .786, p < .01$) scores. The results indicated that there was a significant positive correlation between the posttest vocabulary and posttest reading scores ($r = .557, p < .05$) and a positive correlation between the posttest vocabulary and the posttest listening scores ($r_s = .601, p < .01$).

In contrast to the results of the pretest correlation analyses, after two months of the blended learning aviation English training program, the results of the posttest correlation analyses indicated that there was no significant correlation between the posttest listening and posttest grammar ($r_s = .178, p = .479$) and posttest reading scores ($r_s = .140, p = .579$). In addition, the results indicated that there was no significant correlation between the posttest grammar and posttest vocabulary ($r = .411, p = .090$) and posttest reading scores ($r = .354, p = .149$).

Correlations between Pretest-Posttest Scores

The results of the correlation analyses between pretest-posttest scores on four sections (listening, grammar, vocabulary, and reading) of the AEPE indicated that there was a significant positive correlation between the pretest reading scores and the posttest total scores ($r = .617, p < .01$), and a significant positive correlation between the pretest reading and the posttest reading scores ($r = .745, p < .01$). In addition, the results of the pretest-posttest correlations indicated that there was a significant positive correlation between the pretest vocabulary scores and posttest vocabulary scores ($r = .477, p < .05$).

Results of the pretest-posttest correlation analyses indicated that there was no significant correlation between the posttest total scores and pretest listening ($r = .417, p = .086$), pretest grammar ($r = .288, p = .247$), or the pretest vocabulary ($r = .434, p = .072$) scores. Results indicated that there was no significant correlation between the posttest listening and the pretest listening ($r_s = .313, p = .206$), pretest grammar ($r_s = -.165, p = .513$), pretest vocabulary ($r_s = -.084, p = .741$), or the pretest reading ($rs = .182, p = .469$) scores. Moreover, there was no significant correlation between posttest grammar and pretest grammar ($r = .460, p = .055$), pretest vocabulary ($r = .440, p = .067$), or the pretest reading ($r = .342, p = .164$) scores.

Discussion of Results of Research Question 3

Research Question 3: What are the attitudes of students who are enrolled in the blended learning ESP training program, toward learning ESP with CALL technology?

Discussion of the Pre Survey Results

The results of the descriptive statistical analyses of the pre survey responses to the attitudes toward learning English with the Computer-Assisted Language Learning (CALL) technology indicated that the majority of the participants reported that learning English with CALL was beneficial prior to the beginning of the training program (M = 4.5, SD = .99); 94% of the participants indicated that learning English with CALL technology was beneficial (strongly agree and agree). On the other hand, prior to the beginning of the training program, only 6% of the participants indicated that learning English with CALL was not beneficial (strongly disagree and disagree).

The results indicated that the majority of the participants reported that learning English with CALL was interesting prior to the beginning of the training program (M = 3.78, SD = 1.06). About 72% of the participants indicated that learning English with CALL technology was interesting (strongly agree and agree). On the other hand, prior to the beginning of the training program, only 11% of the participants indicated that learning English with CALL was not interesting (strongly disagree and disagree).

Results indicated that the majority of the participants reported that learning English with CALL was enjoyable prior to the beginning of the training program (M = 3.67, SD = .84). About 67% of the participants indicated that learning English with CALL technology was enjoyable (strongly agree and agree). On the other hand, prior to the beginning of the training program, only 11% of the participants indicated that learning English with CALL was not enjoyable (strongly disagree and disagree).

The majority of the participants reported that learning English with CALL was not difficult prior to the beginning of the training program (M = 2.28, SD = .83); 61% of

the participants indicated that learning English with CALL technology was not difficult (strongly disagree and disagree). On the other hand, prior to the beginning of the training program, only 6% of the participants indicated that learning English with CALL was difficult (strongly agree and agree).

Moreover, the majority of the participants reported that learning English with CALL was not uncomfortable prior to the beginning of the training program ($M = 2.11$, $SD = .76$). About 78% of the participants disagreed with the statement that learning English with CALL technology was uncomfortable (strongly disagree and disagree). On the other hand, prior to the beginning of the training program, only 6% of the participants indicated that learning English with CALL was uncomfortable (strongly agree and agree).

Finally, a majority of the participants reported that they did not prefer learning English with no computer prior to the beginning of the training program ($M = 1.78$, $SD = .81$). That is, about 89% of the participants reported that they did not prefer learning English with no computer (strongly disagree and disagree). On the other hand, prior to the beginning of the training program, only 6% of the participants reported that they preferred learning English with no computer (strongly agree and agree).

Discussion of the Post Survey Results

The results of the descriptive statistics of the post survey responses to participants' attitudes toward learning English with CALL indicated that after two months of the blended learning aviation English training program, the majority of the participants reported that learning English with CALL was beneficial ($M = 4.39$, $SD = .98$). The results of the Wilcoxon matched-pairs signed-ranks tests indicated that there

was no significant difference (z = -.663, p = .507) between the pre survey attitude of "beneficial" (M = 4.5, SD = .985) and the post survey results (M = 4.39, SD = .979).

To be precise, about 94.5% of the participants indicated that learning English with CALL technology was beneficial (strongly agree and agree). Compared to the beginning of the training program, the number of participants who reported that learning English with CALL was beneficial stayed the same as prior to the training program. On the other hand, after two months of training, 6% of the participants indicated that learning English with CALL was not beneficial (strongly disagree and disagree). The number of participants who reported that CALL was not beneficial stayed the same as prior to the beginning of the training program.

The majority of the participants reported that learning English with CALL was interesting after two months of the training program (M = 4.17, SD = .86). About 83%of the participants reported that learning English with CALL was interesting (strongly agree and agree). Compared to the beginning of the training program, the number of participants who reported that learning English with CALL was interesting increased 11%. On the other hand, after two months of the training program, only 6% of the participants reported that learning English with CALL was not interesting (strongly disagree and disagree). Compared to the beginning of the training program, the number of participants who reported that learning English with CALL was not interesting decreased 5%. However, the results of the paired-samples t tests indicated that there was no significant difference (t = -1.519, p = .130) between the pre survey attitude of "interesting" (M = 2.28, SD = 1.060) and the post survey results (M = 4.17, SD = .857).

Results indicated that the majority of participants reported that learning English with CALL was enjoyable after two months of the blended learning aviation English training program ($M = 3.72$, $SD = 1.07$). That is, about 61% of the participants indicated that learning English with CALL technology was enjoyable (strongly agree and agree). Compared to the beginning of the training program, the number of participants who reported that learning English with CALL was enjoyable decreased 6%. On the other hand, after two months of the training program, only 17% of the participants indicated that learning English with CALL was not enjoyable (strongly disagree and disagree). Compared to the beginning of the training program, the number of participants who reported that learning English with CALL was not enjoyable increased 6%. However, the results indicated that there was no significant difference ($t = -.203$, $p = .842$) between the pre survey attitude of "enjoyable" ($M = 3.67$, $SD = .840$) and the post survey results ($M = 3.72$, $SD = 1.074$).

Furthermore, the majority of the participants reported that learning English with CALL was not difficult, after two months of the training program ($M = 2.11$, $SD = 1.08$). Even thought the results of the Wilcoxon matched-pairs signed-ranks tests indicated that there was no significant difference ($z = -.711$, $p = .477$) between the pre survey attitude of "difficult" ($M = 4.5$, $SD = .826$) and the post survey results ($M = 2.11$, $SD = 1.079$). There were about 78% of the participants indicated that learning English with CALL technology was not difficult (strongly disagree and disagree).

Compared to the beginning of the training program, the number of participants who reported that learning English with CALL was not difficult increased 17%. In addition, 11% of the participants indicated that learning English with CALL was difficult

(strongly agree and agree). Compared to the beginning of the training program, the number of participants who reported that learning English with CALL was difficult increased 5%.

The majority of the participants reported that learning English with CALL was not uncomfortable, after two months of the training program ($M = 2.11$, $SD = .76$). The results of the paired-samples t test indicated that there was no significant difference ($t = .000$, $p = 1.000$) between the pre survey attitude of "uncomfortable" ($M = 2.11$, $SD = .758$) and the post survey results ($M = 2.11$, $SD = .758$). There were 78% of the participants disagreed with the statement that learning English with CALL was uncomfortable (strongly disagree and disagree).

Compared to the beginning of the training program, there was no change in the number of participants reporting that learning English with CALL was not uncomfortable. Moreover, 6% of the participants reported that learning English with CALL was uncomfortable (strongly agree and agree). Compared to the beginning of the training program, there was no change in the number of participants reporting that learning English with CALL was uncomfortable.

Finally, the majority of the participants reported that they did not prefer learning English with no computer. After two months of the training program ($M = 1.72$, $SD = .83$); 89% of the participants indicated that they did not prefer learning English with no computer (strongly disagree and disagree). Compared to the beginning of the training program, there was no change in the number of participants reporting that they did not prefer to learn English with no computer.

On the other hand, 6% of the participants reported that they preferred learning English with no computer (strongly agree and agree). Compared to the beginning of the training program, there was no change in the number of participants reporting that they preferred learning English with no computer. The results of the Wilcoxon matched-pairs signed-ranks tests indicated that there was no significant difference ($z = -.214, p = .831$) between the pre survey attitude of "prefer no computer" ($M = 1.78, SD = .808$) and the post survey results ($M = 1.72, SD = .826$).

Additional Correlation Analyses

The results indicated that there was no significant correlation between the pre survey attitude of "beneficial" and the pretest-posttest scores in all components of the AEPE (listening, grammar, vocabulary, reading, and total scores). On the other hand, after two months of the blended learning aviation English training program, there were significant positive correlations between the post survey attitude of "beneficial" and the posttest listening ($r_s = .672, p < .01$), vocabulary ($r_s = .522, p < .05$), and total ($r_s = .541, p < .05$) scores.

The results indicated that there was no significant correlation between the post survey attitude of "beneficial" and the posttest grammar ($r_s = -.011, p = .964$) or reading ($r_s = .433, p = .703$) scores. Results indicated that there was no significant correlation between the pre attitude of "interesting" and the pretest-posttest listening, grammar, vocabulary, reading, or total scores. Moreover, there was no significant correlation between the post survey attitude of "interesting" and the posttest listening, grammar, vocabulary, or total scores.

On the other hand, results indicated that there was a positive correlation between the post survey attitude of "interesting" and the posttest reading scores ($r = .518, p < .05$). There was no significant correlation between the pre survey attitude of "enjoyable" and the pretest-posttest listening, grammar, vocabulary, reading, or total scores. Moreover, the results indicated that there was no significant correlation between the post survey attitudes of "enjoyable" and the posttest listening, grammar, vocabulary, reading, or the total scores. The results indicated that there was no significant correlation between the pre survey attitude of "difficult" and pretest-posttest test scores on listening, grammar, vocabulary, reading, or total scores. Moreover, results of the correlation analyses indicated that there was no significant correlation between participants' responses on the post survey attitude of "difficult" and the posttest listening, grammar, vocabulary, reading, or total scores.

There was no significant correlation between the pre survey attitude of "uncomfortable" and the pretest-posttest listening, grammar, vocabulary, reading, or total scores. Results also indicated that there was no significant correlation between the post survey attitude of "uncomfortable" and the posttest listening, grammar, vocabulary, reading, or total scores. There was no significant correlation between the pre survey attitude of "prefer no computer" and the pretest-posttest listening, grammar, vocabulary, reading, or total scores. Finally, there was no significant correlation between the post survey attitude of "prefer no computer" and the posttest listening, grammar, vocabulary, reading, or total scores.

Correlation Analyses between Demographics and Attitudes toward CALL

The results indicated that there was no significant correlation between participants' demographics (ages and years of prior aviation training experience) and their pre-post surveys attitudes toward learning English with CALL. On the other hand, results indicated that there was a significant negative correlation between participants' years of prior experience studying English and the post survey attitude of "difficult" (r_s = -.704, $p < .01$). Moreover, there was a significant negative correlation between participants' prior experience in working with computers for language learning purposes and the post survey attitude of "difficult" (r_s = -.564, $p < .05$).

Results of Hypotheses 3, 7, 9, and 11 Testing

The results of the analyses indicated that the hypothesis 3 was to be rejected, which hypothesized that there would be no significant correlation between students' prior computer experience and their attitudes toward CALL. In addition, the findings of the study also suggested rejecting hypothesis 11, which hypothesized that there would be no significant correlation between students' prior experience studying English and their attitudes toward CALL.

Furthermore, the findings of the analyses failed to reject hypothesis 9 of the study, which hypothesized that there would be no significant correlation between students' ages and their attitudes toward CALL. In addition, all the participants in this study graduated with college degrees; therefore, the study was not able to test hypothesis 7 of this study. Hypothesis 7 hypothesized that there would be no significant correlation between students' education levels and their attitudes toward learning ESP with CALL technology.

Discussion of Results of Research Question 4

Research Question 4: To what extent do students perceive the CALL technology as facilitating interactions among students in learning ESP?

The mean response to the pre survey perceptions of CALL in facilitating interactions ($M = 3.56$, $SD = 1.15$) indicated that the majority of the participants reported that CALL technology facilitated interactions, prior to the beginning of the training program. That is, about 72% of the participants indicated that CALL facilitated interactions for them in studying English (strongly agree and agree). On the other hand, prior to the beginning of the training program, only 17% of the participants indicated that CALL did not facilitate interactions (strongly disagree and disagree).

After two months of the blended learning aviation English training program, results of the post survey perceptions of CALL in facilitating interactions ($M = 4.0$, $SD = .77$) indicated that a majority of the participants reported that CALL technology facilitated interactions. About 83% of the participants reported that CALL facilitated interactions (strongly agree and agree). Furthermore, the results of the paired-samples t test indicated that there was no significant difference ($t = -1.458$, $p = .163$) between the pre survey perceptions of CALL in facilitating interactions ($M = 3.56$, $SD = .271$) and the post survey results ($M = 4.00$, $SD = .181$).

The descriptive statistics indicated that compared to the beginning of the training program, there was an 11% increase in the number of participants who reported that CALL facilitated interactions among students in studying English (strongly agree and agree). On the other hand, only 6% of the participants reported that CALL did not facilitate interactions in studying English (strongly disagree and disagree). Compared to

the beginning of the training program, there was an 11% decrease in the number of participants reporting that CALL did not facilitate interactions. The results indicated that the majority of the participants in this study indicated that CALL facilitated interactions in studying English, prior to the beginning of the blended learning training program and after two months of the training program.

Additional correlation analyses were utilized to examine if correlation existed between the pre-post survey perceptions of CALL in facilitating interactions and the demographics. Results of the analyses indicated that there was a significant positive correlation between participants' years of experience studying English and their pre survey perceptions of CALL in facilitating interactions ($r = .600, p < .01$). The results of the correlation analyses between the pre-post survey perceptions of CALL in facilitating interactions and the pretest-posttest scores indicated that there were significant positive correlations between the pre survey attitude toward CALL in facilitating interactions and the pretest listening ($r = .548, p < .05$), pretest total ($r = .554, p < .05$), and posttest reading ($r = .515, p < .05$) scores.

In addition, a significant negative relationship existed between the pre survey perceptions of CALL in facilitating interactions and the grammar score gains ($r = -.521, p < .05$). Moreover, the results indicated that there was a significant positive relationship between participants' post survey perceptions of CALL in facilitating interactions and the posttest total scores ($r = .483, p < .05$). Furthermore, the results of the analysis of variance (ANOVA) between the disagreed and agreed groups of pre survey perceptions of CALL in facilitating interactions on their pretest-posttest scores indicated that there was a significant difference ($F = 9.075, p < .01$) between the disagreed group ($M = 16.33$,

$SD = 2.517$) and the agreed group ($M = 24.38$, $SD = 4.388$) on the pretest listening scores. There was a significant difference ($F = 4.612$, $p < .05$) between the disagreed group ($M = 14.00$, $SD = 2.000$) and the agreed group ($M = 18.77$, $SD = 3.655$) on the pretest vocabulary scores.

Moreover, there was a significant difference ($F = 5.344$, $p < .05$) between the disagreed group ($M = 4.00$, $SD = 2.646$) and the agreed group ($M = 8.23$, $SD = 2.891$) on the pretest reading scores. In addition, a significant difference existed ($F = 8.155$, $p < .05$) between the disagreed group ($M = 43.00$, $SD = 4.359$) and the agreed group ($M = 63.54$, $SD = 11.997$) on the pretest total scores. There was a significant difference ($F = 7.456$, $p < .05$) between the disagreed group ($M = 7.00$, $SD = 4.000$) and the agreed group ($M = 11.69$, $SD = 2.394$) on the posttest reading scores.

Additional correlation analyses were performed to examine if correlation existed between participants' attitudes toward CALL and their survey perceptions of CALL in facilitating interactions. The results indicated that there were significant positive correlations between the pre survey perceptions of CALL in facilitating interactions and the pre survey "interesting" ($r = .735$, $p < .01$) and "enjoyable" ($r = .691$, $p < .01$) attitudes toward CALL. In addition, there were significant positive correlations between the pre survey perceptions of CALL in facilitating interactions and the post survey attitudes of "beneficial" ($r_s = .491$, $p < .05$) and "interesting" ($r = .498$, $p < .05$). In addition, there was a significant negative correlation between pre survey perceptions of CALL in facilitating interactions and the post survey attitude of "uncomfortable" ($r = -.615$, $p < .01$).

Moreover, results of the correlation analyses indicated that there were significant positive correlations between the post survey perceptions of CALL in facilitating interactions and the post survey attitudes of "interesting" ($r = .626, p < .01$) and "enjoyable" ($r = .500, p < .05$). In addition, there was a significant negative correlation between the post survey perceptions of CALL in facilitating interactions and the post survey attitude of "uncomfortable" ($r = -.506, p < .05$).

Results of Hypothesis 5 Testing

The findings of the study suggested rejecting the fifth hypothesis of this study, which hypothesized that there would be no significant correlation between students' perceptions of CALL technology as facilitating interactions among students and their attitudes toward learning English for a Specific Purpose with CALL technology.

Discussion of Results of Research Question 5

Research Question 5: Do students' educational levels, age, years of prior computer experience, years of experience studying English, their perceptions of CALL technology as facilitating interactions among students, or their motivations affect their attitudes toward learning ESP with CALL technology?

Demographics and Attitudes toward CALL

All the participants in this study had graduated with college degrees; therefore, the correlation analyses between different educational levels on their attitudes toward CALL were not performed. Moreover, the explanations of the correlations between participants' perceptions of CALL in facilitating interactions and their attitudes toward CALL were presented in the discussion of results of research question 4.

The results of the correlation analyses between participants' demographics (years of aviation training, years of experiences studying English and years of working with computers for language learning purposes) and their pretest-posttest scores indicated that there were significant positive correlations between participants' years of prior aviation training and their pretest reading ($r = .593, p < .01$) and posttest reading ($r = .486, p < .05$) scores.

In addition, there was a significant positive correlation between participants' ages and their pretest reading scores ($r_s = .480, p < .05$). Moreover, results indicated that there was no significant correlation between participants' prior years of experience in working with computers for language learning purposes and their pretest-posttest scores.

Motivations and Attitudes toward CALL

There were significant positive correlations between the pre survey attitude of "beneficial" toward CALL and the post survey motivation of "course requirement" ($r_s = .482, p < .05$), and the pre survey motivation of "become a better educated person" ($r_s = .624, p < .01$). In addition, there were significant positive correlations between the pre survey attitude of "interesting" toward CALL and the pre survey motivations of "become a better educated person" ($r = .696, p < .01$), and "like language learning" ($r = .516, p < .05$).

Moreover, there were significant positive correlations between the pre survey attitude of "enjoyable" toward CALL and the pre survey motivations of "become a better educated person" ($r = .663, p < .5$), "gain respect from others" ($r = .506, p < .05$), and "like language learning" ($r = .526, p < .05$). In addition, there was a significant positive correlation between the pre survey attitude of "difficult" toward CALL and the post

survey motivation of "gain respect from others" ($r = .491, p < .05$). In addition, results indicated that there was no significant correlation between the pre survey attitudes of "uncomfortable" and "prefer no computer" toward CALL and the pre-post motivations.

There was no significant correlation between the post survey attitudes of "beneficial", "interesting", "enjoyable", difficult", and "uncomfortable" toward CALL and all the post survey motivations. On the other hand, there were significant negative correlations between the post survey attitude of "prefer no computer" toward learning English with CALL and the post survey motivations of "for a definite future career in aviation" ($r_s = -.685, p < .01$) and "to interact with English-speakers while living in United States" ($r_s = -.580, p < .05$). Moreover, results of this study indicated that there was a significant positive correlation between the pre survey "interesting" attitude toward CALL and the intrinsic motivation of "like language learning".

Additional correlation analyses were performed between motivations and test scores. Prior to the beginning of the training program, 50% of the participants indicated that they were learning English because it was a course requirement (strongly agree and agree). On the other hand, after two months of the blended learning aviation English training program, 61% of the participants indicated that they were learning English because it was a course requirement (strongly agree and agree). Participants' motivation of "course requirement" increased significantly after two months of training. Paired-samples t test indicated that the increase of the post survey motivation of "meet course requirement" ($M = 3.67, SD = 1.237$) as compared to the pre survey motivation ($M = 3.11, SD = 1.231$) was significant ($t = -2.149, p < .05$).

In addition, the correlation analyses indicated that there was no significant correlation between the pre-post survey motivation of "meet course requirement" and the pretest-posttest scores. The results of the ANOVA analyses indicated that there was no significant difference between the two groups (agreed and disagreed) of motivations of "meet course requirement" on their pretest-posttest scores.

Moreover, there was no significant change in motivation of "definite future career in aviation" after two months of training. Prior to the beginning of the training program, about 55% of the participants reported that learning English was for a definite future career in aviation (strongly agree and agree). After two months of the training program, about 55% of the participants reported that their motivation for learning English was for a definite future career in aviation (strongly agree and agree). Paired-samples *t* test indicated that there was no significant difference ($t = -.148$, $p = .884$) between the pre survey motivation of "definite future career in aviation" ($M = 3.56$, $SD = 1.338$) and the post survey motivation ($M = 3.61$, $SD = 1.290$).

Results indicated that there was no significant correlation between the post survey motivation of "definite future career" and the pretest-posttest scores. On the other hand, there was a significant negative correlation between the pre survey motivation of "for a definite future career in aviation" and the posttest vocabulary scores ($r = -.518$, $p < .05$).

Furthermore, the results of the ANOVA analyses of the pre survey motivation of "definite future career in aviation" indicated there was a significant difference on the pretest vocabulary scores ($F = 10.636$, $p < .01$) between the disagreed group ($M = 21.60$, $SD = 2.793$) and the agreed group ($M = 16.20$, $SD = 3.120$). There was a significant difference on the pretest reading scores ($F = 4.760$, $p < .05$) between the disagreed group

($M = 10.20$, $SD = 2.168$) and the agreed group ($M = 7.70$, $SD = 2.058$). In addition, there was a significant difference on the pretest total scores ($F = 5.897$, $p < .05$) between the disagreed group ($M = 71.00$, $SD = 10.700$) and the agreed group ($M = 56.40$, $SD = 11.098$). Finally, there was a significant difference on the posttest vocabulary scores ($F = 7.455$, $p < .05$) between the disagreed group ($M = 23.60$, $SD = 1.673$) and the agreed group ($M = 20.30$, $SD = 2.406$).

Prior to the beginning of the training, participants who indicated that learning English was for a definite future career in aviation tended to score lower on their pretest vocabulary, pretest reading, pretest total, or posttest vocabulary scores than those who were not "definite future career in aviation" motivated. Furthermore, after two months of training, the results of the ANOVA tests indicated that there was no significant difference between the groups (disagreed and agreed) of the post survey motivation of "definite future career in aviation" on their posttest scores.

Correlation analyses showed that prior to the beginning of the training program, participants who indicated that learning English was for a definite future career in aviation tended to score low on their posttest vocabulary scores after two months of training. Furthermore, ANOVA analyses showed that participants who indicated to have the motivation of "definite future career" on pre survey tended to score lower on the pretest vocabulary, pretest reading, or pretest total scores than those who did not. The negative correlation might be as Ramage (as cited in Noels et al., 2003) indicated that continuing students were more likely to be intrinsically motivated; hence, participants who were not instrumentally motivated tended to score high on their test scores.

About 22% of the participants reported that their motivation for learning English was for traveling, prior to the beginning of the training program (strongly agree and agree). After two months of the training program, only 11% of the participants reported that their motivation for learning English was for traveling (strongly agree and agree). However, the decrease in the number that the participants reported to have the motivation of "traveling" was not statistically significant. The results of Wilcoxon matched-pairs signed-ranks tests showed that there was no significant difference ($z = -1.344$, $p = .179$) between the pre survey motivation of "traveling" ($M = 2.50$, $SD = 1.150$) and the post survey motivation ($M = 2.83$, $SD = .786$).

Furthermore, the motivation of "traveling" did not correlate to the pretest-posttest scores. The results of the correlation analyses indicated there was no significant correlation between the pre and post survey motivations of "traveling" and the pretest-posttest scores. The results of the ANOVA analyses further indicated that there was no significant difference between groups (disagreed and agreed) of the motivation of "traveling" on their pretest-posttest scores.

Prior to the beginning of the training program, 61% of the participants reported that their motivation for learning English was to meet various English-speaking people (strongly agree and agree). After two months of the training program, only about 45% of the participants reported that their motivation for learning English was to meet various English-speaking people (strongly agree and agree). However, the decrease in the number that the participants reported to have the motivation of "meet various English-speaking people" was not statistically significant. The results of the paired-samples t test indicated that there was no significant difference ($t = 1.381$, $p = .185$) between the pre survey

motivation of "meet various English-speaking people" ($M = 3.56$, $SD = 1.042$) and the post survey motivation ($M = 3.17$, $SD = .985$).

Furthermore, the motivation of "meet various English-speaking people" did not correlate to the pretest-posttest scores. Results of the correlation analyses indicated that there was no significant correlation between the pre-post survey motivation of "meet various English-speaking people" and the pretest-posttest scores. In addition, the results of the ANOVA analyses also indicated that there was no significant difference between groups (disagreed and agreed) of the motivation of "meet various English-speaking people" on their pretest-posttest scores.

Prior to the beginning of the training program, 61% of the participants reported that their motivation for learning English was to interact with North Americans while living in the United States (strongly agree and agree). After two months of the training program, 39% of the participants reported that their motivation for learning English was to interact with North Americans while living in the United States (strongly agree and agree). However, the decrease in the number that the participants reported to have the motivation of "interacts with English-speaking North Americans while living in the United States" was not statistically significant. Paired-samples t test indicated that there was no significant difference ($t = 1.377$, $p = .186$) between the pre survey motivation of "interact with English-speaking North Americans while living in the United States" ($M = 3.44$, $SD = 1.338$) and the post survey motivation ($M = 2.83$, $SD = 1.249$).

Moreover, participants' motivations of "interact with English-speaking North Americans while living in the United States" did not correlate to their pretest-posttest scores. The results of the correlation analyses indicated that there was no significant

correlation between the pre-post survey motivations of "interact with English-speaking North Americans while living in United States" and the pretest-posttest scores. The results of the ANOVA also showed that there was no significant difference between groups (disagreed and agreed) of the motivation of "interact with English-speaking North Americans while living in the United States" on their pretest-posttest scores.

Prior to the beginning of the training program, nearly 56% of the participants reported that their motivation for learning English was to become a better educated person (strongly agree and agree). After two months of the training program, about 39% of the participants reported that their motivation for learning English was to become a better educated person (strongly agree and agree). However, the decrease in the number that the participants reported to have the motivation of "become a better educated person" was not statistically significant. Results of the paired-samples *t* test indicated that there was no significant difference ($t = .891, p = .385$) between the pre survey motivation ($M = 3.44$, $SD = 1.338$) and the post survey motivation ($M = 3.06$, $SD = 1.211$) of "become a better educated person".

Participants' motivation of "become a better educated person" did not correlate to their pretest-posttest scores. Results of the correlation analyses indicated that there was no significant correlation between the pre-post survey motivations of "become a better educated person" and the pretest-posttest scores. In addition, results of the ANOVA indicated that there was no significant difference between groups (agreed and disagreed) of the motivation of "become a better educated person" on their pretest-posttest scores.

Prior to the beginning of the training program, only about 11% of the participants reported that learning English was to gain respect from others (strongly agree and agree).

After two months of the training program, there was no participant (0%) who reported a motivation for learning English to gain respect from others (strongly agree and agree). However, the decrease in the number that the participants reported to have the motivation of "gain respect from others" was not statistically significant. The results of the paired-samples *t* test indicated that there was no significant difference ($t = .900$, $p = .381$) between the pre survey motivation ($M = 2.44$, $SD = .922$) and the post survey motivation ($M = 2.28$, $SD = .669$) of "gain respect from others".

Furthermore, participants' motivation of "gain respect from others" did not correlate to their pretest-posttest scores. The results of correlation analyses indicated that there was no significant correlation between the pre-post survey motivations of "gain respect from others" and the pretest-posttest scores. However, the results of the ANOVA showed that there was a significant difference on the posttest listening scores ($F = 7.553$, $p < .05$) between the participants who disagreed ($M = 34.11$, $SD = 2.667$) and agreed ($M = 28.50$, $SD = 2.121$) that their motivation for learning English was to gain respect from others prior to the beginning of the training program. The results might be as Ramage (as cited in Noels et al., 2003) found that continuing students were more intrinsically motivated; therefore, participants who were not motivated by the instrumental motivation of "gain respect from others" tended to score higher than those who were motivated by the instrumental motivation of "gain respect from others."

Prior to the beginning of the training program, more than 77% of the participants reported that their motivation for learning English was for possible career (strongly agree and agree). After two months of training program, more than 83% of the participants reported that their motivation for learning English was for possible career (strongly agree

and agree). However, the increase in the number that the participants reported to have the motivation of "possible future career" was not statistically significant. Results of paired-samples *t* test showed that there was no significant difference ($t = -.437$, $p = .668$) between the pre survey motivation of "possible future career" ($M = 3.94$, $SD = 1.056$) and the post survey motivation ($M = 4.06$, $SD = .802$).

Furthermore, participants' motivation of "possible future career" did not correlate to their pretest-posttest scores. The results of the correlation analyses showed that there was no significant correlation between the pre-post survey motivations of "possible future career" and the pretest-posttest scores. Results of the ANOVA also indicated that there was no significant difference between groups (disagreed and agreed) of the pre survey motivation of "possible future career" on their pretest-posttest scores.

Prior to the beginning of the training program, more than half of the participants (56%) reported that they were learning English because they liked language learning (strongly agree and agree). After two months of the training program, about 28% of the participants reported that they were learning English because they liked language learning (strongly agree and agree). However, the decrease in the number that the participants reported to have the motivation of "like language learning" was not statistically significant. The results of the paired-samples *t* test indicated that there was no significant difference ($t = 1.162$, $p = .261$) between the pre survey motivation of "like language learning" ($M = 3.39$, $SD = 1.243$) and the post survey results ($M = 3.00$, $SD = 1.138$).

In addition, there was a significant positive correlation between the pre survey motivation of "like language learning" and the pretest listening scores ($r = .581$, $p < .05$).

The results of the ANOVA indicated that there was a significant difference on the pretest listening scores ($F = 7.550$, $p < .05$) between participants who disagreed ($M = 16.75$, $SD = 4.856$) and agreed ($M = 24.30$, $SD = 4.572$) on the pre survey motivation of "liked language learning". However, after two months of training, the correlation analyses indicated that there was no significant correlation between the post survey motivation of "like language learning" and the posttest scores. Results of the ANOVA showed that there was no significant difference on the posttest scores between groups (disagreed and agreed) of the post survey motivation of "liked language learning" after two months training.

Prior to the beginning of the training program, about 56% of the participants reported that their motivation for learning English was to continue the interactions with English-speaking North Americans in their home country (strongly agree and agree). After two months of the training program, about 33% of the participants reported that their motivation for learning English was to continue the interactions with English-speaking North Americans in their home country (strongly agree and agree). However, the decrease in the number that the participants reported to have the motivation of "continue the interactions with English-speaking North Americans in my home country" was not statistically significant. The results of the paired-samples t test indicated that there was no significant difference ($t = 1.800$, $p = .090$) between the pre survey ($M = 3.39$, $SD = .979$) and the post survey ($M = 3.00$, $SD = 1.029$) motivations of "continue the interactions with English-speaking North Americans in my home country".

Furthermore, participants' motivation of "continue the interactions with English-speaking North Americans in my home country" did not correlate to their pretest-posttest

scores. Results of the correlation analyses indicated that there was no significant correlation between the pre-post survey motivations of "continue the interactions with English-speaking North Americans in my home country" and the pretest-posttest scores. Results of ANOVA analyses also showed that there was no significant difference on the pretest-posttest scores between groups (disagreed and agreed) of the motivation of "continue the interactions with English-speaking North Americans in my home country".

In summary, results indicated that there was no significant difference between participants' pre and post survey motivations, before and after two months of the blended learning aviation English training program. Results also indicated that there was no significant difference between participants' pre-post survey attitudes toward Computer-Assisted Language Learning, before and after two months of training program.

Results of Hypothesis 13 Testing

The findings of the study suggested rejecting the hypothesis 13 of this study, which hypothesized that there would be no significant correlation between students' motivations for learning English and their attitudes toward learning ESP with CALL technology.

Discussion of Results of Research Question 6

Research Question 6: Do students' educational levels, age, years of prior computer experience, years of experience studying English, years of aviation training experience, amount of time viewing TV and movies, amount of time of students' interactions with native English-speakers, amount of time they communicated in English among themselves, their motivations, their perceptions

of CALL technology as facilitating interactions among students, or their attitudes toward learning ESP with CALL affect their score gains?

Demographics and Score Gains

All 18 of the participants in this study graduated with college degrees therefore, the correlation analysis was not performed on different educational levels and the score gains. The results of the correlation analyses indicated that there was no significant correlation between participants' demographics (years of prior aviation training, years of prior experience studying English, prior years of experience in working with computers for language learning purposes, and ages) and the test score gains in the areas of listening, grammar, vocabulary, reading, and total scores.

Results of Hypotheses 4, 10, 12, and 16 Testing

The results of the study failed to reject the fourth hypothesis of this study, which hypothesized that there would be no significant correlation between students' years of prior computer experience and their score gains. In addition, the findings of the study failed to reject hypothesis 10 of this study, which hypothesized that there would be no significant correlation between students' ages and their score gains. The findings of the study also failed to reject hypothesis 12 of this study, which hypothesized that there would be no significant correlation between students' prior experience studying English and their score gains. The findings of the study failed to reject hypothesis 16 of the study, which hypothesized that would be no significant correlation between students' years of aviation training experience and their score gains.

Confounding Variables

The results of the correlation analyses indicated that there were significant negative correlations between the pre survey amount of time participants interacted with native English-speakers and their listening (r_s = -.478, p < .05), vocabulary (r_s = -.546, p < .05), and total (r_s = -.479, p < .05) score gains. The significant correlations might be caused by the fact that only 2 participants had 2 hours per week interacting with native English-speakers prior to the beginning of the training, while others had 0 hours of interactions with native English-speakers.

On the other hand, after two months of blended learning, there was no significant correlation between the post survey amount of time interacting with native English-speakers and the score gains. In addition, results showed that there was no significant correlation between the pre-post survey amount of time participants watched TV or movies and the score gains. Moreover, there was no significant correlation between the pre-post survey amount of time participants communicated with other students in English and score gains.

Results of Hypotheses 17, 18, and 19 Testing

The finding of the study suggested rejection of hypothesis 17 of this study, which hypothesized that there would be no significant correlation between students' amount of time interacting with native English-speakers and their score gains. The findings of the study failed to reject hypothesis 18 of this study, which hypothesized that there would be no significant correlation between the amount of time students communicated in English among themselves and their score gains. Findings of the study also failed to reject hypothesis 19 of this study, which hypothesized that there would be no significant

correlation between the amount of time students spent viewing TV or movies and their pretest-posttest scores.

Attitudes toward CALL and Score Gains

Results of the correlation analyses indicated that there was no significant correlation between the pre survey attitude of "beneficial" toward CALL and score gains in the areas of listening, grammar, vocabulary, and total scores. On the other hand, the results indicated that there was a significant positive correlation between the pre survey attitude of "beneficial" toward CALL and the reading score gains ($r_s = .487, p < 05$). Participants who indicated that learning English with CALL was beneficial before the training program tended to have higher reading test score gains. The results of the correlation analyses indicated that there was no significant correlation between the post survey attitude of "beneficial" toward CALL and the score gains in the areas of listening, grammar, vocabulary, reading, and total scores.

On the other hand, results indicated that there were significant positive correlations between the post survey attitude of "beneficial" toward CALL and the posttest listening ($r_s = .672, p < .01$), vocabulary ($r_s = .522, p < .05$), and total ($r_s = .541, p < .05$) scores. After two months of blended learning, participants who indicated "beneficial" attitude toward CALL tended to score high on their posttest listening, vocabulary, and total scores.

Furthermore, results of the correlation analyses indicated that there was a significant negative correlation between the pre survey attitude of "interesting" toward CALL and the grammar score gains ($r = -.733, p < .01$). In addition, results of the ANOVA analyses on the pre survey attitude of "interesting" toward CALL indicated that

there was a significant difference on the grammar score gains ($F = 25.296$, $p < .01$) between participants who disagreed ($M = 10.50$, $SD = .707$) and agreed ($M = 1.31$, $SD = 2.496$) that learning English with CALL was interesting. However, the ANOVA analyses indicated that there was a significant difference on the pretest grammar scores ($F = 5.238$, $p < .05$) between the disagreed ($M = 6.00$, $SD = .000$) and agreed ($M = 11.92$, $SD = 3.546$) groups. In addition, results of correlation analyses indicated that there was no significant correlation between the pre survey attitude of "interesting" toward CALL and the pretest grammar scores ($r = .412$, $p = .090$), or posttest grammar scores ($r = -.349$, $p = .156$).

Moreover, there was no significant correlation between the pre survey attitude of "interesting" toward CALL and the pretest total scores ($r = .313$, $p = .206$), posttest total scores ($r = -.104$, $p = .683$), or total score gains ($r = -.440$, $p = .068$). In addition, results of the ANOVA indicated that that there was a significant difference on the pretest total scores ($F = 4.948$, $p < .05$) between the disagreed group ($M = 40.50$, $SD = .707$) and the agreed group ($M = 59.77$, $SD = 11.868$). On the other hand, results of the ANOVA analyses showed that there was a significant difference on the total score gains ($F = 7.748$, $p < 05$) between the participants who disagreed ($M = 39.00$, $SD = 9.899$) and agreed ($M = 17.23$, $SD = 10.329$) that learning English with CALL was interesting prior to the training program.

Before beginning the training program, participants who indicated that CALL was interesting tended to score higher on their pretest grammar scores than those who did not think CALL was interesting. However, the findings showed that participants who indicated that CALL was interesting before the training program tended to have smaller

score gains on the grammar test scores than those who did not feel that CALL was interesting. Participants who indicated that CALL was interesting before the training program tended to score higher on the pretest total scores than those who did not think CALL was interesting; however, participants who indicated that CALL was interesting before the training program tended to have smaller score gains on the total test scores than those who did not.

The relationships are difficult to interpret, the "*five problems*" of interpretation of raw gain scores might have contributed to the relationships (Gall et at., 1996). It might be that using CALL in learning English did not necessarily match participants' expectations before the training programs, or the participants who scored higher on their pretest grammar scores were restricted to the range of improvement. That is, the problem of "*ceiling effect*" might have occurred (Gall et al., 1996). Furthermore, the problem of "*regression toward the mean*" might have also contributed to the relationships, in which the greater score gains were made by low achievers (Gall et al., 1996).

Moreover, results of the correlation analyses showed that there was a significant positive correlation between the post survey attitude of "interesting" and the reading score gains ($r = .585, p < .05$). Furthermore, there was also a significant positive correlation between the post survey "interesting" attitude toward CALL and the posttest reading scores ($r = .518, p < .05$). Participants who indicated that CALL was interesting after the training program tended to score high on their posttest reading scores and to have high score gains on the reading test scores.

Results of correlation analyses indicated that there was no significant correlation between the pre survey attitude of "enjoyable" toward CALL and the pretest grammar

scores ($r = .238$, $p = .341$), posttest grammar scores ($r = -.410$, $p = .091$), pretest total scores ($r = .242$, $p = .333$), or posttest total scores ($r = -.270$, $p = .279$). On the other hand, the results of the correlation analyses indicated that there were significant negative correlations between the pre survey attitude of "enjoyable" toward CALL and the grammar score gains ($r = -.617$, $p < .01$), and the total score gains ($r = -.506$, $p <. 05$).

Participants who indicated an "enjoyable" attitude toward CALL before beginning the training program tended to have smaller score gains on the grammar and total test scores. Furthermore, the ANOVA analyses showed that there was a significant difference on the grammar score gains ($F = 24.831$, $p < .01$) between the disagreed group ($M = 10.50$, $SD = .707$) and the agreed group ($M = 1.17$, $SD = 2.552$). In addition, there was a significant difference on the total score gains ($F = 13.228$, $p < .01$) between the disagreed group ($M = 39.00$, $SD = 9.899$) and the agreed group ($M = 15.42$, $SD = 8.350$).

However, results of ANOVA analyses on the pre survey attitude of "enjoyable" showed that there was a significant difference on the pretest total scores ($F = 4.931$, $p < .05$) between the disagreed group ($M = 45.50$, $SD = .707$) and the agreed group ($M = 60.33$, $SD = 12.213$). Participants who indicated the "enjoyable" attitude toward CALL before the training program tended to score higher on the pretest total scores than those did not feel CALL was enjoyable. Moreover, there was a significant difference on the listening score gains ($F = 7.404$, $p < .05$) between the disagreed group ($M = 17.00$, $SD = 2.828$) and the agreed group ($M = 8.08$, $SD = 4.400$). Participants who indicated an "enjoyable" attitude toward CALL before beginning of the training program tended to have smaller score gains on the listening test scores.

The significant negative correlations and significant differences between groups were difficult to explain, compared to the groups' differences on their pretest total scores. The negative relationships might be that using CALL in learning English did not necessarily match participants' expectations before the training programs, or the problems of "*ceiling effect*" and "*regression toward the mean*" might have contributed to the significant differences and the significant negative relationships.

Results of the correlation analyses showed a significant positive correlation existed between the post survey attitude of "enjoyable" toward CALL and reading score gains ($r = .627, p < .01$). In addition, the results of the ANOVA analyses on the post survey attitude of "enjoyable" indicated that there was a significant difference on the reading score gains ($F = 10.073, p < .01$) between participants who disagreed ($M = .00$, $SD = 1.000$) and agreed ($M = 3.91$, $SD = 2.023$) that learning English with CALL was enjoyable. Participants who indicated an "enjoyable" attitude toward CALL after two months of the training program tended to have higher score gains on the reading test scores. On the other hand, after two months of blended learning, participants who had higher score gains on the reading test scores tended to report an "enjoyable" attitude toward CALL.

Furthermore, results of the correlation analyses indicated that there was no significant correlation between the pre survey attitude of "difficult" toward CALL and the score gains. On the other hand, there were negative correlations between the post survey attitude of "difficult" and the listening score gains ($r_s = -.616, p < .01$), and the total score gains ($r_s = -.571, p < .05$). In addition, the results of the ANOVA analyses on the post survey "difficult" indicated that there was a significant difference on the

listening score gains ($F = 5.790$, $p < .05$) between the participants who disagreed ($M = 12.29$, $SD = 5.239$) and agreed ($M = 3.00$, $SD = 2.828$) that learning English with CALL was difficult. Participants who reported a "difficult" attitude toward CALL after two months of the training program tended to have small score gains on the listening and total test scores. Moreover, after two months of training, participants who had small score gains on the listening or total test scores tended to indicate a "difficult" attitude toward CALL.

In addition, results of the correlation analyses indicated that there was no significant correlation between the pre-post survey attitudes of "uncomfortable" toward CALL and score gains. There was no significant correlation between the pre-post survey attitudes of "prefer no computer" and the score gains in the areas of listening, grammar, vocabulary, reading, or total scores.

In summary, the negative relationships between the pre survey attitudes toward CALL and the score gains might be that using CALL in learning English did not necessarily match participants' expectations before the training programs, or the problems of "*ceiling effect*" and "*regression toward the mean*" might have contributed to the significant differences and the significant negative relationships. On the other hand, the positive correlations between post survey positive attitudes toward CALL and score gains corresponded to the expectations of this study. Furthermore, the findings of participants who had positive attitudes toward CALL tended to have higher score gains than those who had negative attitudes toward CALL also corresponded to the expected results of the study. The findings of the post survey attitude toward CALL corroborated

Noels et al's (2003) findings that positive attitudes toward the learning situation are consistently associated with second language learning achievement.

Results of Hypothesis 15 Testing

The findings of the "beneficial", "interesting", "enjoyable", and "difficult" attitudes toward using CALL in learning English suggested rejection of hypothesis 15, which hypothesized that there would be no significant correlation between students' attitudes toward learning ESP with CALL technology and their score gains.

Perceptions of CALL in Facilitating Interactions and Score Gains

Results of correlation analyses indicated that there was no significant correlation between the pre survey attitudes toward CALL in facilitating interactions and the score gains in the areas of listening, vocabulary, reading, and total scores. On the other hand, results showed that there were significant positive correlations between the pre survey perceptions of CALL in facilitating interactions and the pretest listening scores ($r = .548$, $p < .05$), pretest total scores ($r = .554$, $p < .05$), and posttest reading scores ($r = .515$, $p < .05$).

Moreover, the results of the ANOVA analyses on the pre survey perceptions of CALL in facilitating interaction indicated that there was a significant difference on the pretest listening ($F = 9.075$, $p < .01$) between the disagreed group ($M = 16.33$, $SD = 2.517$) and the agreed group ($M = 24.38$, $SD = 4.388$). There was a significant difference on the pretest vocabulary scores ($F = 4.612$, $p < .05$) between the disagreed group ($M = 14.00$, $SD = 2.000$) and the agreed group ($M = 18.77$, $SD = 3.655$).

Furthermore, there was a significant difference on the pretest reading scores ($F = 5.344$, $p < .05$) between the disagreed group ($M = 4.00$, $SD = 2.646$) and the agreed group

($M = 8.23$, $SD = 2.891$). There was also a significant difference on the pretest total scores ($F = 8.155$, $p < .05$) between the disagreed group ($M = 43.00$, $SD = 4.359$) and the agreed group ($M = 63.54$, $SD = 11.997$). In addition, there was a significant difference on the posttest reading scores ($F = 7.456$, $p < .05$) between the disagreed group ($M = 7.00$, $SD = 4.000$) and the agreed group ($M = 11.69$, $SD = 2.394$). Participants who indicated positive perceptions of CALL in facilitating interactions before beginning the training program tended to score higher on pretest listening, pretest vocabulary, pretest reading, or pretest total scores than those who did not have positive perceptions of CALL in facilitating interactions.

Conversely, results indicated that there was a significant negative correlation between the pre survey perceptions of CALL in facilitating interactions and the grammar score gains ($r = -.521$, $p < .05$). In addition, results of ANOVA on the pre survey perceptions of CALL in facilitating interactions indicated that there was a significant difference on the grammar score gains ($F = 6.821$, $p < .05$) between disagreed ($M = 7.00$, $SD = 6.083$) and agreed ($M = 1.54$, $SD = 2.504$) groups. Participants who indicated positive perceptions of CALL in facilitating interactions before beginning the training program tended to have smaller score gains on the grammar test scores.

Results of the correlation analyses indicated that there was no significant correlation between post survey perceptions of CALL in facilitating interactions and the score gains. On the other hand, results showed that there were significant positive correlations between the post survey perceptions of CALL in facilitating interactions and the posttest listening scores ($r = .479$, $p < .05$) and the posttest total scores ($r = .483$, $p < .05$). Participants who indicated positive perceptions of CALL in facilitating interactions

after two months of blended learning tended to score high on the posttest listening or total scores. Moreover, participants who scored high on their posttest listening or total scores tended to indicate positive perceptions of CALL in facilitating interactions after two months of the training program.

In summary, the negative relationship between the pre survey perceptions of CALL in facilitating interactions and the grammar score gains might be that the particular CALL system did not necessarily match participants' expectations before the training programs; or the problems of "*ceiling effect*" and "*regression toward the mean*" might have contributed to the significant difference and the significant negative relationship. On the other hand, as the study expected, there were the positive correlations between post survey positive perceptions of CALL in facilitating interactions and the posttest listening and total scores. The findings of the post survey perceptions of CALL in facilitating interactions also corroborated Noels et al's (2003) findings that positive attitudes toward the learning situation are consistently associated with second language learning achievement.

Results of Hypothesis 6 Testing

The findings of the study suggested rejection of the sixth hypothesis of the study, which hypothesized that there would be no significant correlation between students' perceptions of CALL technology as facilitating interactions among students and their score gains.

Motivations and Score Gains

The results of the correlation analyses indicted that there was no significant correlation between the pre-post survey motivations of "meet course requirement" and

the score gains or pretest-posttest scores. In addition, results of the ANOVA analyses on the pre-post survey motivations of "meet course requirement" also indicated that there was no significant difference between groups (disagreed and agreed) on the score gains and pretest-posttest scores.

Results of the correlation analyses indicated that there was no significant correlation between the pre-post survey motivations of "a definite future career in aviation" and the score gains. Moreover, results of the ANOVA analyses on the pre-post survey motivations of "a definite future career in aviation" indicated that there was no significant difference between groups (disagreed and agreed) on score gains.

Results of the correlation analyses indicated that there were significant negative correlation between the pre survey motivation of "traveling" and the listening ($r = -.497$, $p < .05$), grammar ($r = -.570$, $p < .05$), and total ($r = -.611$, $p < .01$) score gains. Participants who reported to have the motivation of "traveling" prior to the beginning the training program tended to have smaller score gains on listening, grammar, or total test scores. However, the correlation analyses showed no significant correlation between pre-post survey motivations of "traveling" and the pretest-posttest scores.

Moreover, the ANOVA analyses on pre-post survey motivations of "traveling" also indicated no significant difference on the pretest-posttest scores or score gains between the disagreed and the agreed groups. Thus, the negative relationship is difficult to interpret. The "*five problems*" (Gall, et al., 1996) of interpretation of raw gain scores might have contributed to the relationship.

The results of the correlation analyses indicated that there was no significant correlation between the post survey motivation of "traveling" and the score gains. Results

of the ANOVA analyses on the pre-post survey motivations of "traveling" indicated no significant difference on score gains between the disagreed and the agreed groups.

Results of the correlation analyses indicated that there was no significant correlation between pre-post survey motivations of "meet various English-speaking people" and the score gains. Moreover, results of the ANOVA analyses on the pre-post survey motivations of "meet various English-speaking people" also indicated no significant difference on the score gains between the disagreed and the agreed groups.

Results of the correlation analyses indicated that there was no significant correlation between the pre-post survey motivations of "interact with English-speaking North Americans while living in the United States" and the score gains. In addition, results of the ANOVA analyses of pre-post survey motivations further indicated no significant difference on the score gains between the disagreed and the agreed groups.

Furthermore, results of the correlation analyses indicated that there was a significant negative correlation between the pre survey motivation of "become a better educated person" and the grammar score gains ($r = -.508$, $p < .05$). On the other hand, there was no significant correlation between the post survey motivation of "become a better educated person" and the scores gains. Participants who reported to have the motivation of "become a better educated person" prior to the beginning of the training program tended to have smaller score gains on the grammar test scores.

However, the correlation analyses showed no significant correlation between the pre-post survey motivations of "become a better educated person" and the pretest or posttest scores. Moreover, results of the ANOVA analyses of the pre-post survey motivations of "become a better educated person" indicated no significant difference on

the score gains between the disagreed and the agreed groups. Therefore, the negative correlation between the pre survey motivation of "become a better educated person" and the grammar score gains is difficult to interpret. The "*five problems*" (Gall, et al., 1996) of interpretation of raw gain scores might have contributed to the relationship.

Results of correlation analyses indicated that there was a significant negative correlation between the pre survey motivation of "gain respect from others" and the listening score gains ($r = -.542, p < .05$). However, results of the ANOVA analyses on pre survey motivation of "gain respect from others" indicated no significant difference on score gains between the disagreed and the agreed groups. In addition, the correlation analyses indicated no significant correlation between pre-post survey motivations of "gain respect from others" and the pretest-posttest scores or score gains.

Moreover, the correlation analyses indicated that there was no significant correlation between the post survey motivation of "gain respect from others" and the score gains. The negative relationship between the pre survey motivation of "gain respect from others" and the listening score gains is difficult to interpret. The "*five problems*" (Gall, et al., 1996) of interpretation of raw gain scores might have contributed to the relationship.

Results of the correlation analyses indicated that there was a significant positive correlation ($r = .498, p < .05$) between the pre survey motivation of "possible future career" and the grammar score gains. The ANOVA analyses showed a significant difference on the pretest grammar scores ($F = 5.360, p < .05$) between the disagreed group ($M = 15.00$, $SD = 1.000$) and the agreed group ($M = 10.21$, $SD = 3.468$). Moreover, results of ANOVA analyses on the post survey motivation of "possible future career"

indicated no significant difference on the score gains between the disagreed and the agreed groups.

Prior to beginning the training program, participants who reported to have the motivation of "possible future career" tended to score lower on the pretest grammar scores than those who were not motivated for a possible future career. On the other hand, participants who reported to have the motivation of "possible future career" tended to have high score gains on the grammar test scores. The problem of "*regression toward the mean*" (Gall, et al., 1996) of the gain scores might have contributed to the phenomenon, in which the greater gains are made by the low achievers.

The results of the correlation analyses indicated that there was no significant correlation between the pre survey motivation of "like language learning" and the score gains. On the other hand, results of the ANOVA analyses on the pre survey motivation of "like language learning" indicated that there was a significant difference on the listening score gains ($F = 8.017, p < .05$) between the disagreed ($M = 17.00$, $SD = 4.397$) and the agreed ($M = 9.10$, $SD = 4.818$) groups. Participants who were "like language learning" motivated before the training program tended to have lower listening score gains than those who were not.

However, the ANOVA analyses showed there was a significant difference on the pretest listening scores ($F = 7.550, p < .05$) between the disagreed group ($M = 16.75$, $SD = 4.856$) and the agreed group ($M = 24.30$, $SD = 4.572$). Participants who were "like language learning" motivated prior to the beginning of the training program tended to score higher on the pretest listening scores than those who were not "like language learning" motivated. On the other hand, the correlation analyses indicated that there was

a significant negative correlation between the post survey motivation of "like language learning" and the listening score gains (r = -.485, p < .041).

Similar to the pre survey results, the results of the ANOVA analyses on the post survey motivation of "like language learning" also showed that there was a significant difference on the listening score gains (F = 7.021, p < .05) between the disagreed group (M = 15.80, SD = 5.263) and the agreed group (M = 8.40, SD = 3.362). The problem of "*regression toward the mean*" (Gall, et al., 1996) of the gain scores might have contributed to the phenomenon, in which the greater gains are made by the low achievers.

The correlation analyses indicated that there was no significant correlation between the pre-post survey motivations of "continue the interactions with English-speaking North Americans in my home country" and the score gains or pretest-posttest scores. The results of the ANOVA analyses on the pre-post survey motivations of "continue the interactions with English-speaking North Americans in my home country" indicated no significant difference on score gains or pretest-posttest scores between the disagreed and agreed groups.

Results of Hypothesis 14 Testing

The findings of the correlations of the motivations of "traveling", "become a better educated person", "gain respect from others", "possible future career", and the "like language learning" and the test scores suggested rejection of hypothesis 14, which hypothesized that there would be no significant correlation between students' motivations and their score gains.

Even though results of some of the hypotheses testing (4, 6, 10, 12, 14, 15, 16, 17, 18, and 19) on the correlations between motivations and score gains were significant, the

relationships were difficult to interpret. The phenomena were likely to be caused by the five problems of the measurement of change that were discussed by Gall et al (1996) were likely to contribute to the phenomenon. The five problems of the measurement of change are: *ceiling effect, regression toward the mean, assumption of equal intervals, different types of ability, and low reliability* (Gall et al, 1996). "A ceiling effect occurs when the range of difficulty of the test item is limited, and therefore scores at the higher end of the possible score continuum are artificially restricted" (Gall et al, 1996, p. 533).

The *regression toward the mean* problem causes students who earn high scores on the pretest to earn somewhat lower scores on the posttest, and those who score low on the pretest to score somewhat higher scores on the posttest (Gall et al, 1996). The problem of *assumption of equal intervals* refers to that "use of gain scores assumes equal intervals at all points of the test, yet this assumption almost never is valid for educational measures" (Gall et al, 1996, p. 534). The problem of *different types of ability* refers to that "with the exception of a factorially pure test, a given score on a test may reflect different types and levels of ability for different students" (Gall et al, 1996, p. 534).

Moreover, the problem of *low reliability* simply refers to the fact that gain scores are usually not reliable (Gall et al, 1996). The five problems of measuring score gains: *ceiling effect, regression toward the mean, assumption of equal intervals, different types of ability, and low reliability* might have contributed to the significant negative relationships between variables and score gains. The problems might have occurred when the negative relationships between variables and the score gains were significant, while the significant positive correlations existed between the variables and the pretest or posttest scores. Therefore, a summary of this chapter and the Chapter 5 will be based on

the relationships between variables and the pretest-posttest scores, instead of the score gains.

Summary

The purpose of this chapter was to investigate the data to determine the effectiveness of implementing the Computer-Assisted Language Learning systems with an instructor (blended learning) in the English for Specific Purpose training program. Participants' pretest-posttest scores on the Aviation English Placement Exam were assessed. Participants' posttest scores were statistically significantly higher than their pretest scores in all the components of AEPE (listening, grammar, vocabulary, reading, and total scores).

In addition, there were significant correlations between participants' test scores and their motivations (instrumental, integrative, and intrinsic). There were significant positive correlations between participants' perceptions of CALL in facilitating interactions and their test scores. Moreover, there were significant positive correlations between participants' positive attitudes toward learning English with CALL and their test scores. Additionally, there were correlations between some of participants' motivations and their attitudes toward CALL. Conclusions and recommendations based on the results of the statistical analyses will be presented in Chapter 5.

CHAPTER V

FINDINGS, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

This chapter will review the major findings of this study. A section of the summary will be presented in this chapter. Conclusions based on the characteristics of the pilot group, descriptive and inferential analyses of the research questions will be included. Recommendations for future research will also be presented. Finally, a discussion of the practical implications of the findings concerning the effectiveness of blended learning ESP training program will be presented.

Summary of the Study

Restatement of the Problem

The trend in employee training has swung back from e-learning to classroom training programs (Salopek, 2002). "As learners become more exposed to and comfortable with e-learning, their expectations for any learning experience--including classroom sessions--are changing" (p. 74); furthermore, particular e-learning elements are being incorporated into the classrooms (Salopek, 2002). In the role of facilitating students' learning, it is important for all stakeholders of ESP training programs to investigate the effectiveness of implementing online learning CALL systems into the distance-learning environment and the traditional classroom environment of the programs (blended learning).

The implementation of blended learning could have the potential of attracting more investors and students to the particular training program. Quan (2000) indicated that the online training market has grown from zero in 1996 to $1.2 billion in 1999 and the

market was expected to reach $10 billion to $12 billion by 2003. Moreover, "Credit Suisse First Boston Corp has predicted a $40-billion market by 2005 for Web-based learning alone" (Rosenbaum, 2001, p. 38). This study intends to address the extent to which the implementation of the blended learning in the corporate ESP training program is effective.

Information Collected

Participants' pretest and posttest scores on the Aviation English Placement Exam (AEPE) were collected. The participating institution utilized the AEPE to assess students' achievements on the aviation English. The pretest was given to all 18 participants before the beginning of the blended learning aviation English training program. The posttest was given to the same participants after two months of intervention. Both the pretest and the posttest data was provided by the institution to the researcher.

A survey instrument was developed in Chinese by the researcher and approved by the Eminent Translation Service Co. to collect the data of participants' background information including: (1) educational levels, (2) age, (3) gender, amount of time they interacted with native English-speakers, (4) amount of time they viewed TV and movies in English, (5) amount of time they communicated in English among themselves, (6) years of prior computer experience, (7) years of experience studying English, (8) years of aviation training experience, and (8) their motivations for learning English.

In addition, students' perceptions of CALL technology in facilitating interactions and their attitudes toward learning English with CALL technology were also collected via the survey. Participants of the pilot group of this one group pretest-posttest study were 18

adult male flight students who were enrolled in a corporate blended learning Aviation English training program that was offered by a flight academy located in central Florida.

Restatement of Research Questions

Descriptive and inferential research questions were investigated:

Research Question 1: To what extent is there a significant difference between the pretest and the posttest scores of students who are enrolled in the English for Specific Purposes (ESP) training program implemented with the online learning Computer-Assisted Language Learning (CALL) technology blended with an instructor in the classroom (blended learning)?

Research Question 2: To what extent is there a significant difference between the pretest and the posttest scores of students who are enrolled in the blended learning ESP training program in the areas of listening, reading, vocabulary, and grammar components of the test?

Research Question 3: What are the attitudes of students who are enrolled in the blended learning ESP training program, toward learning ESP with CALL technology?

Research Question 4: To what extent do students perceive the CALL technology as facilitating interactions among students in learning ESP?

Research Question 5: Do students' educational levels, age, years of prior computer experience, years of experience studying English, their perceptions of CALL technology as facilitating interactions among students, or their motivations affect their attitudes toward learning ESP with CALL technology?

Research Question 6: Do students' educational levels, age, years of prior computer experience, years of experience studying English, years of aviation training

experience, amount of time viewing TV and movies, amount of time of students' interactions with native English-speakers, amount of time they communicated in English among themselves, their motivations, their perceptions of CALL technology as facilitating interactions among students, or their attitudes toward learning ESP with CALL affect their score gains?

Restatement of the Theoretical Rationale

The theoretical rationale for this study draws from the second language learning and Computer-Assisted Language Learning researches. Chen and Zhao (1997) indicated that Computer-Assisted Language Learning (CALL) systems have been an integral part of the foreign language classroom. Furthermore, CALL can help language learners to develop language fluency in a matter of hours, rather than weeks, months, and years (Davies & Williamson, 1998). CALL provides tools and rich environments for foreign language learners with the databases of references of materials that encourage creative interactions (Armington et al., 1990). Hall (1998) indicates that the optimal amount of grammar teaching varies depending on factors, such as, age, gender, level in the foreign language, purpose of learning the language, cognitive ability, and motivations.

Moreover, students who had experience with the CALL software tends to have enhanced navigational skills and language skills (Bueno et al., 1999). Davies and Williamson (1998) suggest that students learn at different speeds, "some will bring more previous knowledge of the target language to the learning environment than others" (p.13). Davies and Williamson (1998) further indicate that motivations of language learning are the core condition of individualized learning, which is the "interactivity" element of CALL systems between computers and learners (p.15).

Several studies suggested that instrumental motivation may be stronger in learning English as a second language, and students without integrative motivation learned better in some cases (Aacken, 1999). Aacken (1999) attempted to correlate second language learners' motivations and their attitudes toward learning the second language with CALL technology. Aacken's (1999) study on language learning motivations and the attitudes toward CALL were the frameworks of the survey development of this study.

Summary of Analyses

Demographics of Participants

All 18 participants in the study were college-graduated males. Participants' average age was 25 years old. The youngest participant was 22 years old and the oldest participant was 27 years old. The average number of years in the aviation training was 3.4 years. Only one participant had no prior aviation training experience; 16.7% of the participants had 2 years of prior aviation training experience; and 77.7% of the participants had 3 or more years of aviation training experience.

Participants had prior experience studying English from 2 to 12 years. The average year of participants' prior experience studying English was nearly 8.3 years. About 33% of the participants had 8 or fewer years of prior experience studying English; about 67% of the participants had 10 or more years of prior experience studying English.

The average length of the participants' prior computers experience for language learning was about 1.6 years. Participants had been working with computers for language learning purposes from 0 to 4 years. 22.3% of the participants had less than 1 year of prior experience in working with computers for language learning purposes; more than

55% of the participants had 1 to 2 years of prior experience in working with computers for language learning purposes. Furthermore, about 22% of the participants had 3 or more years of prior experience in working with computers for language learning purposes.

Descriptive Statistics of Pretest-Posttest Scores

Participants' mean pretest listening scores were 22.22 or about 55% correct in the listening section. The mean pretest grammar score was 11.22 or about 56% correct in the grammar section. The mean pretest vocabulary score was 17.39 or 70% correct in the vocabulary section. The mean pretest reading score was 7.56 or 50% correct in the reading section. Moreover, the mean pretest total score was 58.39%.

Participants' mean posttest listening scores were 32.56 or about 81% correct in the listening section. The mean posttest grammar score was 13.72 or about 68% correct in the grammar section. The mean posttest vocabulary score was 21.22 or about 85% correct in the vocabulary section. The mean posttest reading score was 10.61 or 71% correct in the reading section. Finally, the mean posttest total score was 78.11%.

Comparison between Pretest-Posttest Scores

There was a significant difference ($t = 6.973$, $p < .01$) between the posttest total scores ($M = 78.11$, $SD = 10.476$) and the pretest total scores ($M = 58.39$, $SD = 13.404$). A significant difference existed ($z = -3.762$, $p < .01$) between the posttest listening scores ($M = 32.56$, $SD = 4.805$) and pretest listening scores ($M = 22.22$, $SD = 5.494$). In addition, there was a significant difference ($t = 4.600$, $p < .01$) between the posttest vocabulary scores ($M = 21.22$, $SD = 2.734$) and the pretest vocabulary scores ($M = 17.39$, $SD = 3.898$). Moreover, there was a significant difference ($t = 5.869$, $p < .01$) between the

posttest reading scores ($M = 10.61$, $SD = 3.071$) and the pretest reading scores ($M = 7.56$, $SD = 3.110$).

Correlations between Pretest Scores

The results indicated that there were significant positive correlations between the pretest total scores and the posttest total scores ($r = .518$, $p < .05$), pretest listening and scores ($r = .844$, $p < .01$), pretest grammar scores ($r = .781$, $p < .01$), pretest vocabulary scores ($r = .922$, $p < .01$), and the pretest reading scores ($r = .754$, $p < .01$). The results indicated that there were significant positive correlations between the pretest listening scores and the pretest vocabulary scores ($r = .658$, $p < .01$), pretest reading scores ($r = .553$, $p < .05$), and pretest grammar scores ($r = .423$, $p = .080$).

In addition, there was a significant positive correlation between the pretest grammar scores and pretest vocabulary scores ($r = .814$, $p < .01$). Moreover, the results indicated that there was a significant positive correlation between the pretest vocabulary scores and pretest reading scores ($r = .612$, $p < .01$)

Correlations between Posttest Scores

There were significant positive correlations between the posttest total scores and the posttest listening scores ($r_s = .622$, $p < .01$), posttest grammar scores ($r = .550$, $p < .05$), posttest vocabulary scores ($r = .870$, $p < .01$), and posttest reading scores ($r = .786$, $p < .01$). In addition, there was a significant positive correlation between the posttest listening and posttest vocabulary scores ($r_s = .601$, $p < .01$). Moreover, there was a significant positive correlation between the posttest vocabulary and posttest reading scores ($r = .557$, $p < .05$).

Correlations between Pretest-Posttest Scores

Results indicated that there was a significant positive correlation between the posttest total scores and the pretest reading scores ($r = .617, p < .01$). In addition, results indicated that there was a significant positive correlation between the posttest vocabulary and pretest vocabulary scores ($r = .477, p < .05$). Moreover, there was a significant positive correlation between the posttest reading and pretest reading scores ($r = .745, p < .01$).

Correlations between Demographics and Test Scores

Results indicated that there was no significant correlation between participants' years of prior experience studying English and their pretest-posttest scores, or score gains. There was no significant correlation between participants' prior years of experience in working with computers for language learning purposes and their pretest-posttest scores, or score gains. Moreover, results indicated that there were significant positive correlations between participants' years of prior aviation training and their pretest reading scores ($r = .593, p < .01$) and their posttest reading scores ($r = .486, p < .05$). In addition, there was a significant positive correlation between participants' age and their pretest reading scores ($r_s = .480, p < .05$).

Descriptive Statistics and Correlations between Motivation of Course Requirement and Test Scores

The mean response to the pre survey motivation of "meet course requirements" was 3.11, and the standard deviation was 1.23. Prior to the beginning of the training program, 50% of the participants indicated that they were learning the English because it was a course requirement (strongly agree and agree). The mean response to the post

survey motivation of "meet course requirements" was 3.67, and the standard deviation was 1.24. After two months of the blended learning aviation English training program, 61% of the participants indicated that they were learning the English because it was a course requirement (strongly agree and agree).

There was no significant correlation between the pre survey motivation of "meet course requirement" and the pretest-posttest scores or score gains. Furthermore, there was no significant correlation between the post survey motivation of "meet course requirement" and the posttest scores or score gains.

Analysis of variance (ANOVA) was utilized to analyze if there was a significant difference between the two groups (disagreed and agreed) of the pre survey motivation of "meet course requirement" on their test scores. Results indicated that there was no significant difference between the two groups on their pretest-posttest scores or score gains.

Analysis of variance (ANOVA) was utilized to analyze if there was a significant difference between the two groups (disagreed and agreed) of the post survey motivation of "meet course requirement" on their test scores. Results showed that there was no significant difference between the two groups on their posttest scores or score gains.

Descriptive Statistics and Correlations between Motivation of Definite Future Career in Aviation and Test Scores

The mean response to the pre survey motivation of "definite future career in aviation" was 3.56, and the standard deviation was 1.34. Prior to the beginning of the training program, more than 55% of the participants reported that their motivation for learning English was for a definite future career in aviation (strongly agree and agree).

The mean response to the post survey motivation of "definite future career in aviation" was 3.61, and the standard deviation was 1.29. After two months of the training program, more than 55% of the participants reported that their motivation for learning English was for a definite future career in aviation (strongly agree and agree).

There was no significant correlation between the pre survey motivation of "definite future career in aviation" and the pretest-posttest scores. Moreover, there was no significant correlation between the pre survey motivation of "definite future career in aviation" and the listening, grammar, vocabulary, reading, or total score gains. On the other hand, there was a significant negative correlation between the pre survey motivation of "definite future career in aviation" and the posttest vocabulary scores (r = -.518, $p < .05$). Furthermore, there was no significant correlation between the post survey motivation of "definite future career in aviation" and the posttest scores or score gains.

Analysis of variance (ANOVA) was utilized to analyze if there was a significant difference between the two groups (disagreed and agreed) of pre survey motivation of "definite future career in aviation" on their pretest-posttest scores and score gains. Results indicated that there was a significant difference ($F = 10.636$, $p < .01$) on the pretest vocabulary scores between the disagreed group ($M = 21.60$, $SD = 2.793$) and the agreed group ($M = 16.20$, $SD = 3.120$). There was a significant difference ($F = 4.760$, $p < .05$) on the pretest reading scores between the disagreed group ($M = 10.20$, $SD = 2.168$) and the agreed group ($M = 7.70$, $SD = 2.058$). In addition, there was a significant difference ($F = 5.897$, $p < .05$) on the pretest total scores between the disagreed group ($M = 71.00$, $SD = 10.700$) and the agreed group ($M = 56.40$, $SD = 11.098$). Furthermore, there was a significant difference ($F = 7.455$, $p < .05$) on the posttest vocabulary scores

between the disagreed group ($M = 23.60$, $SD = 1.673$) and the agreed group ($M = 20.30$, $SD = 2.406$).

Moreover, results of the ANOVA analyses on the post survey motivation of "definite future career in aviation" indicated that there was no significant difference between the two groups on their posttest scores or score gains.

Descriptive Statistics and Correlations between Motivation of Traveling and Test Sores

The mean response to the pre survey motivation of "traveling" was 2.5, and the standard deviation was 1.15. About 22% of the participants reported that their motivation for learning English was for traveling, prior to the beginning of the training program (strongly agree and agree). The mean response to the post survey motivation of "traveling" was 2.83, and the standard deviation was .79. Only 11% of the participants reported that their motivation for learning English was for traveling, after two months of the training program (strongly agree and agree).

There was no significant correlation between the pre survey motivation of "traveling" and the pretest-posttest scores. Moreover, there was a significant negative correlation ($r = -.497$, $p < .05$) between the pre survey motivation of "traveling" and the listening score gains. There was a significant negative correlation ($r = -.570$, $p < .05$) between the pre survey motivation of "traveling" and the grammar score gains ($M = 2.50$, $SD = 3.634$). Results also indicated that there was a significant negative correlation ($r = -.611$, $p < .01$) between the pre survey motivation of "traveling" and the total score gains. Furthermore, there was no significant correlation between the post survey motivation of "traveling" and the posttest scores or score gains.

Analysis of variance (ANOVA) was utilized to analyze if there was a significant difference between the two groups (disagreed and agreed) of the pre survey motivation of "traveling" on their pretest-posttest scores and score gains. Results showed that there was no significant difference between the two groups on their pretest-posttest scores or score gains.

In addition, results of the ANOVA analyses of the post survey motivation of "traveling" on their posttest scores and score gains indicated that there was no significant difference between the two groups on their posttest scores or score gains.

Descriptive Statistics and Correlations between Motivation of Meet Various English-Speaking People and Test Scores

The mean response to the pre survey motivation of "meet various English-speaking people" was 3.56, and the standard deviation was 1.04. Prior to the beginning of the training program, 61% of the participants reported that their motivation for learning English was to meet various English-speaking people (strongly agree and agree). The mean response to the post survey motivation of "meet various English-speaking people" was 3.17, and the standard deviation was .99. After two months of the training program, nearly 45% of the participants reported that their motivation for learning English was to meet various English-speaking people (strongly agree and agree).

The results indicated that there was no significant correlation between the pre survey motivation of "meet various English-speaking people" and the pretest-posttest scores or score gains. Furthermore, results indicated that there was no significant correlation between the post survey motivation of "meet various English-speaking people" and the posttest scores or score gains

Analysis of variance (ANOVA) was utilized to analyze if there was a significant difference between the two groups (disagreed and agreed) of pre survey motivation of "meet various English-speaking people" on their pretest-posttest scores and score gains. Results indicated that there was no significant difference between the two groups on their pretest-posttest scores or score gains. Furthermore, results of the ANOVA analyses of the post survey motivation of "meet various English-speaking people" on the posttest scores and score gains indicated that there was no significant difference between the two groups on their posttest scores or score gains.

Descriptive Statistics and Correlations between the Motivation of Interact with North Americans while Living in the United States and the Test Scores

The mean response to the pre survey motivation of "interact with English-speaking North Americans while living in the United States" was 3.44, and the standard deviation was 1.34. Prior to the beginning of the training program, 61% of the participants reported that their motivation for learning English was to interact with North Americans while living in the United States (strongly agree and agree). The mean response to the post survey motivation of "interact with English-speaking North Americans while living in the United States" was 2.83, and the standard deviation was 1.25. After two months of the training program, 39% of the participants reported that their motivation for learning English was to interact with North Americans while living in the United States (strongly agree and agree).

Results indicated there was no significant correlation between the pre survey motivation of "interact with English-speaking North American while living in the United States" and the pretest-posttest scores or score gains. Furthermore, results indicated that

there was no significant correlation between the post survey motivation of "interact with North Americans while living in the United States" and the posttest scores or score gains.

Analysis of variance (ANOVA) was utilized to analyze if there was a significant difference between the two groups (disagreed and agreed) of pre survey motivation of "interact with English-speaking North Americans while living in United States" on the pretest-posttest scores and score gains. Results indicated that there was no significant difference between the two groups on their pretest-posttest scores or score gains. Furthermore, results of the ANOVA analyses of post survey motivation of "interact with English-speaking North Americans while living in United States" indicated that there was no significant difference between the two groups on their posttest scores or score gains.

Descriptive Statistics and Correlations between Motivation of Become a Better Educated Person and the Test Scores

The mean response to the pre survey motivation of "become a better educated person" was 3.44, and the standard deviation was 1.34. Prior to the beginning of the training program, nearly 56% of the participants reported that their motivation for learning English was to become a better-educated person (strongly agree and agree). The mean response to the post survey motivation of "become a better educated person" was 3.06, and the standard deviation was 1.211. After two months of the training program, nearly 39% of the participants reported that their motivation for learning English was to become a better educated person (strongly agree and agree).

The results indicated that there was no significant correlation between the pre survey motivation of "become a better educated person" and the pretest-posttest scores. Moreover, there was a significant negative correlation ($r = -.508$, $p < .05$) between the pre

survey motivation of "become a better educated person" and the grammar score gains. Furthermore, there was no significant correlation between the post survey motivation of "become a better educated person" and the posttest scores or score gains.

Analysis of variance (ANOVA) was utilized to analyze if there was a significant difference between the two groups (disagreed and agreed) of pre survey motivation of "become a better educated person" on their pretest-posttest scores and score gains. Results showed that there was no significant difference between the two groups on their pretest-posttest scores or score gains. Moreover, results of the ANOVA analyses of post survey "become a better educated person" on the posttest scores and score gains indicated that there was no significant difference between the two groups on their posttest scores or score gains.

Descriptive Statistics and Correlations between Motivation of Gain Respect from Others and the Test Scores

The mean response to the pre survey motivation of "gain respect from others" was 2.44, and the standard deviation was .92. Prior to the beginning of the training program, only about 11% of the participants reported that their motivation for learning English was to gain respect from others (strongly agree and agree). Furthermore, the mean response to the post survey motivation of "gain respect from others" was 2.28, and the standard deviation was .67. After two months of the training program, there was no participants (0%) reported that their motivation for learning English was to gain respect from others (strongly agree and agree).

There was no significant correlation between the pre survey motivation of "gain respect from others" and the pretest-posttest scores. In addition, there was a significant

negative correlation (r = -.542, p < .05) between the pre survey motivation of "gain respect from others" and the listening score gains. Furthermore, there was no significant correlation between the post survey motivation of "gain respect from others" and the posttest scores or score gains.

Analysis of variance (ANOVA) was utilized to analyze if there was a significant difference between the two groups (disagreed and agreed) of pre survey motivation of "gain respect from others" on their pretest-posttest scores and score gains. Results indicated that there was no significant difference between the two groups on their pretest scores or score gains. In addition, there was a significant difference (F = 7.553, p < .05) on the posttest listening scores between the disagreed group (M = 34.11, SD = 2.667) and the agreed group (M = 28.50, SD = 2.121).

Descriptive Statistics and Correlations between Motivation of Possible Future Career and the Test Scores

The mean response to the pre survey motivation of "possible future career" was 3.94, and the standard deviation was 1.06. Prior to the beginning of the training program, more than 77% of the participants reported that their motivation for learning English was for possible career (strongly agree and agree). The mean response to the post survey motivation of "possible future career" was 4.06, and the standard deviation was .80. After two months of training program, more than 83% of the participants reported that their motivation for learning English was for possible career (strongly agree and agree).

There was no significant correlation between the pre survey motivation of "possible future career" and the pretest-posttest scores. In addition, there was a significant positive correlation (r = .498, p < .05) between the pre survey motivation of

"possible future career" and the grammar score gains. Furthermore, results indicated that there was no significant correlation between the post survey motivation of "possible future career" and the posttest scores or score gains.

Analysis of variance (ANOVA) was utilized to analyze if there was a significant difference between the two groups (disagreed and agreed) of pre survey motivation of "possible future career" on their pretest-posttest scores and score gains. Results indicated that there was a significant difference ($F = 5.360$, $p < .05$) on the pretest grammar scores between the disagreed group ($M = 15.00$, $SD = 1.000$) and the agreed group ($M = 10.21$, $SD = 3.468$). Furthermore, there was no significant difference between the two groups on their posttest scores or score gains.

Descriptive Statistics and Correlations between Motivation of Like Language Learning and the Test Scores

The mean response to the pre survey motivation of "like language learning" was 3.39, and the standard deviation was 1.24. Prior to the beginning of the training program, more than half of the participants (56%) reported that their motivation for learning English was because they liked language learning (strongly agree and agree). The mean response to the post survey motivation of "like language learning" was 3, and the standard deviation was 1.14. After two months of the training program, 28% of the participants reported that their motivation for learning English was because they liked language learning (strongly agree and agree).

Results indicated that there was a significant positive correlation between the pre survey motivation of "like language learning" and the pretest listening scores ($r = .581$, $p < .05$). Moreover, there was no significant correlation between the pre survey motivation

of "like language learning" and the posttest scores or score gains. Furthermore, results indicated that there was no significant correlation between the post survey motivation of "like language learning" and the posttest scores. On the other hand, there was a significant negative correlation (r = -.485, p < .041) between the post survey motivation of "like language learning" and the listening score gains.

Analysis of variance (ANOVA) was utilized to analyze if there was a significant difference between the two groups (disagreed and agreed) of pre survey motivation of "like language learning" on their pretest-posttest scores and score gains. Results indicated that there was a significant difference (F = 7.550, p < .05) on the pretest listening scores between the disagreed group (M = 16.75, SD = 4.856) and the agreed group (M = 24.30, SD = 4.572). Furthermore, there was no significant difference between the two groups on their posttest scores. On the other hand, results indicated that there was a significant difference (F = 8.017, p < .05) on the listening score gains between the disagreed group (M = 17.00, SD = 4.397) and the agreed group (M = 9.10, SD = 4.818).

Results of the ANOVA analyses of post survey motivation of "like language learning" on the posttest scores and score gains indicated that there was no significant difference between the two groups on their posttest scores. In addition, there was a significant difference (F = 7.021, p < .05) on the listening score gains between the disagreed group (M = 15.80, SD = 5.263) and the agreed group (M = 8.40, SD = 3.362).

Descriptive Statistics and Correlations Motivation of Continue the Interactions with English-Speaking North Americans in My Home Country and the Test Scores

The mean response to the pre survey motivation of "continue the interactions with English-speaking North Americans in my home country" was 3.39, and the standard

deviation was .98. Prior to the beginning of the training program, about 56% of the participants reported that their motivation for learning English was to continue the interactions with English-speaking North Americans in their home country (strongly agree and agree). The mean response to the post survey motivation of "continue the interactions with English-speaking North Americans in my home country" was 3, and the standard deviation was 1.03. After two months of the training program, about 33% of the participants reported that their motivation for learning English was to continue the interactions with English-speaking North Americans in their home country (strongly agree and agree).

Results indicated that there was no significant correlation between the pre survey motivation of "continue the interactions with English-speaking North Americans in my home country" and the pretest-posttest scores or score gains. Furthermore, there was no significant correlation between the post survey motivation of "continue the interactions with English-speaking North Americans in my home country" and the posttest scores or score gains.

Analysis of variance (ANOVA) was utilized to analyze if there was a significant difference between the two groups (disagreed and agreed) of the pre survey motivation of "continue the interactions with English-speaking North Americans in my home country" on their pretest-posttest scores and score gains. Results indicated that there was no significant difference between the two groups on their pretest-posttest scores or score gains. Moreover, results of the ANOVA analyses of the post survey motivation of "continue the interactions with English-speaking North Americans in my home country"

on their posttest scores and score gains indicated that there was no significant difference between the two groups on their posttest scores or score gains.

Comparison between Pre and Post Survey Motivations

Results showed that the increase on the post survey motivation of "meet course requirement" for learning English ($M = 3.67$, $SD = 1.237$) as compared to the pre survey results ($M = 3.11$, $SD = 1.231$) was statistically significant ($t = -2.149$, $p < .05$). On the other hand, results showed that there was no significant difference ($t = -.148$, $p = .884$) between the pre survey motivation of "definite future career in aviation" ($M = 3.56$, $SD = 1.338$) and the post survey results ($M = 3.61$, $SD = 1.290$). In addition, there was no significant difference ($t = 1.381$, $p = .185$) between the pre survey motivation of "meet various English-speaking people" ($M = 3.56$, $SD = 1.042$) and the post survey results ($M = 3.17$, $SD = .985$).

Furthermore, there was no significant difference ($t = 1.377$, $p = .186$) between the pre survey motivation of "interact with English-speaking North Americans while living in the United States" ($M = 3.44$, $SD = 1.338$) and the post survey results ($M = 2.83$, $SD = 1.249$). There was no significant difference ($t = .891$, $p = .385$) between the pre survey motivation of "become a better educated person" ($M = 3.44$, $SD = 1.338$) and the post survey motivation results ($M = 3.06$, $SD = 1.211$). There was no significant difference ($t = .900$, $p = .381$) between the pre survey motivation of "gain respect from others" ($M = 2.44$, $SD = .922$) and the post survey results ($M = 2.28$, $SD = .669$).

Moreover, there was no significant difference ($t = -.437$, $p = .668$) between the pre survey motivation of "possible future career" ($M = 3.94$, $SD = 1.056$) and the post survey results ($M = 4.06$, $SD = .802$). There was no significant difference ($t = 1.162$, $p =$

.261) between the pre survey motivation of "like language learning" ($M = 3.39$, $SD = 1.243$) and the post survey results ($M = 3.00$, $SD = 1.138$). Results also indicated that there was no significant difference ($t = 1.800$, $p = .090$) between the pre survey motivation of "continue the interactions with English-speaking North Americans in my home country" ($M = 3.39$, $SD = .979$) and the post survey results ($M = 3.00$, $SD = 1.029$). In addition, there was no significant difference ($z = -1.344$, $p = .179$) between the pre survey motivation of "traveling" ($M = 2.50$, $SD = 1.150$) and the post survey results ($M = 2.83$, $SD = .786$).

Correlations between Demographics and Pre-Post Survey Motivations

The results of correlation analyses indicated that there was no significant correlation between participants' years of prior experience studying English and their pre survey motivations. In addition, there was no significant correlation between participants' years of prior aviation training experience and their pre survey motivations. On the other hand, results indicated that there was a significant positive correlation between participants' years of experience in working with computers for language learning purposes and their pre survey motivation of "interact with English-speaking North Americans while living in the United States" ($r = .491$, $p < .05$). Results showed that there was no significant correlation between participants' ages and their pre survey motivations.

Results indicated that there was no significant correlation between participants' years of prior experience studying English and their post survey motivations. There was no significant correlation between participants' years of prior aviation training experience and their post survey motivations. Moreover, there was no significant correlation between

participants' years of experience in working with computers for language learning purposes and their post survey motivations. In addition, there was no significant correlation between participants' ages and their post survey motivations.

Descriptive Statistics and Correlations between Pre Survey Attitudes toward CALL and Test Scores

The mean response to the pre survey attitude of "beneficial" toward CALL was 4.5, and the standard deviation was .99. Prior to the beginning of the training program, about 94% of the participants indicated that learning English with CALL technology was beneficial (strongly agree and agree). The mean response to the pre survey "interesting" attitude toward CALL was 3.78, and the standard deviation was 1.06. Moreover, the mean response to the pre survey "enjoyable" attitude toward CALL was 3.67, and the standard deviation was .84. The mean response to the pre survey "difficult" attitude toward CALL was 2.28, and the standard deviation was .83. In addition, the mean response to the pre survey "uncomfortable" attitude toward CALL was 2.11, and the standard deviation was .76. Finally, the mean response to the pre survey "prefer no computer" attitude toward CALL was 1.78, and the standard deviation was .81.

There was no significant correlation between the pre survey attitude of "beneficial" and the pretest-posttest scores. On the other hand, there was a significant positive correlation between the pre survey attitude of "beneficial" toward CALL and the reading score gains ($r_s = .487, p < 05$). Moreover, there was no significant correlation between the pre survey attitude of "interesting" and the pretest-posttest scores. Results indicated that there was a significant negative correlation between the pre survey attitude of "interesting" and the grammar score gains ($r = -.733, p < .01$). Furthermore, there was

no significant correlation between the pre survey attitude of "enjoyable" and the pretest-posttest scores. On the other hand, there were significant negative correlations between the pre survey attitude of "enjoyable" toward CALL and the grammar score gains (r = -.617, p < .01) and the total score gains (r = -.506, p <. 05).

In addition, there was no significant correlation between the pre survey attitude of "difficult" toward CALL and the pretest-posttest scores or score gains. Results also showed that there was no significant correlation between the pre survey attitude of "uncomfortable" toward CALL and the pretest-posttest scores or score gains. Finally, there was no significant correlation between the pre survey attitude of "prefer no computer" and the pretest-posttest scores or score gains.

Descriptive Statistics and Correlations between Post Survey Attitudes toward CALL and Test Scores

The mean response to the post survey "beneficial" attitude toward was 4.39, and the standard deviation was .98. The mean response to the post survey "interesting" attitude toward CALL was 4.17, and the standard deviation was .86. Moreover, the mean response to the post survey "enjoyable" attitude toward CALL was 3.72, and the standard deviation was 1.07. The mean response to the post survey "difficult" attitude toward CALL was 2.11, and the standard deviation was 1.08. Furthermore, the mean response to the post survey "uncomfortable" attitude toward CALL was 2.11, and the standard deviation was .76. Finally, the mean response to the post survey "prefer no computer" attitude toward CALL was 1.72, and the standard deviation was .83.

Results indicated that there was no significant correlation between the post survey attitude of "beneficial" and score gains. On the other hand, there were significant positive

correlations between the post survey attitude of "beneficial" and the posttest listening (r_s = .672, $p < .01$), vocabulary (r_s = .522, $p < .05$), and the total (r_s = .541, $p < .05$) scores. Moreover, results indicated that there was a positive correlation between the post survey attitude of "interesting" and posttest reading scores (r = .518, $p < .05$), and reading score gains (r = .585, $p < .05$).

Furthermore, there was no significant correlation between the post survey attitude of "enjoyable" and the posttest scores. On the other hand, there was a significant positive correlation between the post survey attitude of "enjoyable" and reading score gains (r = .627, $p < .01$). Results showed that there was no significant correlation between the post survey attitude of "difficult" and the posttest scores. Conversely, results indicated that there were negative correlations between the post survey attitude of "difficult" and the listening score gains (r_s = -.616, $p < .01$), and the total score gains (r_s = -.571, $p < .05$). Moreover, there was no significant correlation between the post survey attitude of "uncomfortable" and the posttest scores or score gains. Finally, there was no significant correlation between the post survey attitude of "prefer no computer" and the posttest scores or score gains.

The ANOVA analyses were utilized to examine if there was a significant difference between groups (disagreed and agreed) of the pre survey attitude of "interesting" on the pretest-posttest scores and score gains. Results indicated that there was a significant difference (F = 5.238, $p < .05$) on the pretest grammar scores between the disagreed group (M = 6.00, SD = .000) and agreed group (M = 11.92, SD = 3.546). There was a significant difference (F = 4.948, $p < .05$) on the pretest total scores between the disagreed group (M = 40.50, SD = .707) and the agreed group (M = 59.77, SD =

11.868). In addition, there was a significant difference ($F = 25.296$, $p < .01$) on the grammar score gains between the disagreed group ($M = 10.50$, $SD = .707$) and the agreed group ($M = 1.31$, $SD = 2.496$). There was a significant difference ($F = 7.748$, $p < 05$) on the total score gains between the disagreed group ($M = 39.00$, $SD = 9.899$) and the agreed group ($M = 17.23$, $SD = 10.329$).

Results of the ANOVA analyses of the pre survey attitude of "enjoyable" on the pretest-posttest scores and score gains indicated that there was a significant difference ($F = 4.931$, $p < .05$) on the pretest total scores between the disagreed group ($M = 45.50$, $SD = .707$) and the agreed group ($M = 60.33$, $SD = 12.213$). There was a significant difference ($F = 7.404$, $p < .05$) on the listening score gains between the disagreed group ($M = 17.00$, $SD = 2.828$) and the agreed group ($M = 8.08$, $SD = 4.400$). Moreover, there was a significant difference ($F = 24.831$, $p < .05$) on the grammar score gains between the disagreed group ($M = 10.50$, $SD = .707$) and the agreed group ($M = 1.17$, $SD = 2.552$).

Results of the ANOVA analyses of the post survey attitude of "enjoyable" on the posttest scores and score gains indicated that there was a significant difference ($F = 10.073$, $p < .01$) on the reading score gains between the disagreed group ($M = .00$, $SD = 1.000$) and the agreed group ($M = 3.91$, $SD = 2.023$). Furthermore, results of the ANOVA analyses of pre survey attitude of "difficult" on the pretest-posttest scores and score gains indicated that there was a significant difference ($F = 28.736$, $p < .01$) on the posttest listening scores between the disagreed group ($M = 34.14$, $SD = 22.00$) and the agreed group ($M = 22.00$, $SD = 7.071$). There was a significant difference ($F = 9.572$, $p < .01$) on the posttest vocabulary scores between the disagreed group ($M = 21.93$, $SD = 2.401$) and agreed group ($M = 16.50$, $SD = .707$).

Moreover, there was a significant difference ($F = 5.889, p < .05$) on the posttest reading scores between the disagreed group ($M = 11.00$, $SD = 2.572$) and agreed group ($M = 6.00$, $SD = 4.243$). There was a significant difference ($F = 17.768, p < .01$) on the posttest total scores between the disagreed group ($M = 80.64$, $SD = 7.561$) and the agreed group ($M = 56.50$, $SD = 7.778$). In addition, there was a significant difference ($F = 5.790$, $p < .05$) on the listening score gains between the disagreed group ($M = 12.29$, $SD = 5.239$) and the agreed group ($M = 3.00$, $SD = 2.828$).

Comparison between Pre-Post Survey Attitudes toward CALL

Results indicated that there was no significant difference ($z = -.663, p = .507$) between the pre survey attitude of "beneficial" ($M = 4.5$, $SD = .985$) and the post survey results ($M = 4.39$, $SD = .979$). There was no significant difference ($t = -1.519, p = .130$) between the pre survey attitude of "interesting" ($M = 2.28$, $SD = 1.060$) and the post survey results ($M = 4.17$, $SD = .857$). In addition, there was no significant difference ($t = -.203, p = .842$) between the pre survey attitude of "enjoyable" ($M = 3.67$, $SD = .840$) and the post survey results ($M = 3.72$, $SD = 1.074$).

Moreover, the results indicated that there was no significant difference ($z = -.711$, $p = .477$) between the pre survey attitude of "difficult" ($M = 4.5$, $SD = .826$) and the post survey results ($M = 2.11$, $SD = 1.079$). There was no significant difference ($t = .000, p = 1.000$) between the pre survey attitude of "uncomfortable" ($M = 2.11$, $SD = .758$) and the post survey results ($M = 2.11$, $SD = .758$). Finally, there was no significant difference ($z = -.214, p = .831$) between the pre survey attitude of "prefer no computer" ($M = 1.78$, $SD = .808$) and the post survey results ($M = 1.72$, $SD = .826$).

Correlations between Pre-Post Survey Attitudes toward CALL and Pre-Post Survey Motivations

There were significant positive correlations between the pre survey attitude of "beneficial" toward CALL and the post survey motivation of "course requirement" (r_s = .482, $p < .05$), and the pre survey motivation of "become a better educated person" (r_s = .624, $p < .01$). In addition, there were significant positive correlations between the pre survey attitude of "interesting" toward CALL and the pre survey motivations of "become a better educated person" ($r = .696$, $p < .01$), and "like language learning" ($r = .516$, $p < .05$).

There were significant positive correlations between the pre survey attitude of "enjoyable" toward CALL and the pre survey motivations of "become a better educated person" ($r = .663$, $p < .5$), "to gain respect from others" ($r = .506$, $p < .05$), and "like language learning" ($r = .526$, $p < .05$). Furthermore, there was a significant positive correlation between the pre survey attitude of "difficult" toward CALL and the post survey motivation of "gain respect from others" ($r = .491$, $p < .05$). Results indicated that there was no significant correlation between the pre survey attitude of "uncomfortable" toward CALL and the pre-post survey motivations. In addition, there was no significant correlation between the pre survey attitude of "prefer no computer" and the pre-post survey motivations.

Furthermore, there was no significant correlation between the post survey "beneficial", "interesting", "enjoyable", difficult", and "uncomfortable" attitudes toward CALL and all the post survey motivations. On the other hand, there were significant negative correlations between the post survey attitude of "prefer no computer" and the

post survey motivations of "definite future career in aviation" (r_s = -.685, p < .01), and "interact with English-speakers while living in United States" (r_s = -.580, p < .05).

Correlations between Demographics and Pre-Post Survey Attitudes toward CALL

Results indicated that there was no significant correlation between participants' years of prior aviation training experience and their pre-post survey attitudes toward CALL. In addition, there was no significant correlation between participants' ages and their pre-post survey attitudes toward CALL. Moreover, there was no significant correlation between participants' years of prior experience studying English and the pre survey attitudes toward CALL. On the other hand, results indicated that there was a significant negative correlation between participants' years of prior experience studying English and the post survey "difficult" (r_s = -.704, p < .01) attitude toward CALL.

Furthermore, results indicated that there was no significant correlation between participants' years of prior experience in working with computers for language learning purposes and the pre survey attitudes toward CALL. On the other hand, there was a significant negative correlation between participants' prior experience in working with computers for language learning purposes and the post survey "difficult" (r_s = -.564, p < .05) attitude toward CALL.

Descriptive Statistics and Correlations between Pre Survey Perceptions of CALL in Facilitating Interactions and Test Scores

The mean response to the pre survey perceptions of CALL in facilitating interactions was 3.56, and the standard deviation was 1.15. Prior to the beginning of the training program, about 72% of the participants indicated that CALL facilitated interactions in the classroom (strongly agree and agree).

There were significant positive correlations between the pre survey perceptions of CALL in facilitating interactions and the pretest listening ($r = .548, p < .05$) and total ($r = .554, p < .05$) scores. On the other hand, there was no significant correlation between pre survey perceptions of CALL in facilitating interactions and the pretest grammar, vocabulary, or reading scores. There was no significant correlation between the pre survey perceptions and the posttest listening, grammar, vocabulary, or total scores. Moreover, there was no significant correlation between the pre survey perceptions and the listening, vocabulary, reading, or total score gains.

Furthermore, results indicated that there was a significant positive correlation between the pre survey perceptions of CALL in facilitating interactions and the posttest reading scores ($r = .515, p < .05$). In addition, there was a significant negative correlation between the pre survey perceptions of CALL in facilitating interactions and the grammar score gains ($r = -.521, p < .05$).

Analysis of variance (ANOVA) was utilized to analyze if there was a significant difference between the two groups (disagreed and agreed) of the pre survey perceptions of CALL in facilitating interactions on the pretest-posttest scores and score gains. There was a significant difference ($F = 9.075, p < .01$) on the pretest listening scores between the disagreed group ($M = 16.33$, $SD = 2.517$) and the agreed group ($M = 24.38$, $SD = 4.388$). There was a significant difference ($F = 4.612, p < .05$) on the pretest vocabulary scores between the disagreed group ($M = 14.00$, $SD = 2.000$) and the agreed group ($M = 18.77$, $SD = 3.655$). In addition, there was a significant difference ($F = 5.344, p < .05$) on the pretest reading scores between the disagreed group ($M = 4.00$, $SD = 2.646$) and the agreed group ($M = 8.23$, $SD = 2.891$). Moreover, there was a significant difference ($F =$

8.155, $p < .05$) on the pretest total scores between the disagreed group ($M = 43.00$, $SD = 4.359$) and the agreed group ($M = 63.54$, $SD = 11.997$).

Furthermore, there was no significant difference between the two groups on their posttest listening, grammar, vocabulary, or total scores. On the other hand, results indicated that there was a significant difference ($F = 7.456$, $p < .05$) on the posttest reading scores between the disagreed group ($M = 7.00$, $SD = 4.000$) and the agreed group ($M = 11.69$, $SD = 2.394$). There was no significant difference between the two groups on their listening, vocabulary, reading, or total score gains. Moreover, there was a significant difference ($F = 6.821$, $p < .05$) on the grammar score gains between the disagreed group ($M = 7.00$, $SD = 6.083$) and the agreed group ($M = 1.54$, $SD = 2.504$).

Correlations between Demographics and Pre Survey Perceptions of CALL in Facilitating Interactions

Results indicated that there was no significant correlation between participants' pre survey perceptions of CALL in facilitating interaction and their years of prior aviation training experience ($r = .310$, $p = .211$), their ages ($r_s = .237$, $p = .345$), or their years of prior experience in working with computers for language learning purposes ($r = .432$, $p = .073$). On the other hand, there was a significant positive correlation between participants' years of experience studying English and their pre survey perceptions of CALL in facilitating interactions ($r = .600$, $p < .01$).

Correlations between Pre Survey Perceptions of CALL in Facilitating Interactions and Attitudes toward CALL

Results indicated that there was no significant correlation between pre survey perceptions of CALL in facilitating interactions and the pre survey attitudes of

"beneficial" (r_s = .274, p = .272), "difficult" (r = -.110, p = .664), "uncomfortable" (r = -.278, p = .265), or "prefer no computer" (r_s = -.187, p = .457). On the other hand, results indicated that there were significant positive correlations between the pre survey perceptions of CALL in facilitating interactions and the pre survey attitudes of "interesting" (r = .735, p <.01), and "enjoyable" (r = .691, p < .01).

Furthermore, results indicated that there was no significant correlation between the pre survey perceptions of CALL in facilitating interactions and the post survey "enjoyable" (r = .418, p = .084), or "difficult" (r_s = -.425, p = .079) attitudes toward CALL. Moreover, there were significant positive correlations between the pre survey perceptions of CALL in facilitating interactions and the post survey attitudes of "beneficial" (r_s = .491, p < .05), and "interesting" (r = .498, p < .05). In addition, there was a significant negative correlation between pre survey perceptions of CALL in facilitating interactions and the post survey "uncomfortable" (r = -.615, p < .01) attitude toward CALL.

Descriptive Statistics and Correlations between Post Survey Perceptions of CALL in Facilitating Interactions and Test Scores

The mean response to the post survey perceptions of CALL in facilitating interactions was 4.0, and the standard deviation was .77. After two months of the training program, about 83% of the participants indicated that CALL facilitated interactions among students in the classroom (strongly agree and agree).

Results indicated that there were significant positive correlations between the post survey perceptions of CALL in facilitating interactions and the posttest listening (r = .479, p < .05), and total (r = .483, p < .05) scores. On the other hand, there was no

significant correlation between post survey perceptions of CALL in facilitating interactions and the posttest grammar ($r = .274, p = .271$), vocabulary ($r = .280, p = .260$), or reading ($r = .350, p = .155$) scores. In addition, there was no significant correlation between the post survey perceptions and the listening ($r = .218, p = .384$), grammar ($r = .380, p = .120$), vocabulary ($r = .195, p = .438$), reading ($r = .382, p = .118$), or total ($r = .352, p = .153$) score gains.

Correlations between Demographics and Post Survey Perceptions of CALL in Facilitating Interactions

Results indicated that there was no significant correlation between post survey perceptions of CALL in facilitating interaction and participants' ages ($r_s = .136, p = .590$), their years of prior aviation training experience ($r = .194, p = .440$), years of prior experience studying English ($r = -.332, p = .179$), or prior years of experience in working with computers for language learning purposes ($r = .000, p = 1.000$).

Correlations between Post Survey Perceptions of CALL in Facilitating Interactions and Attitudes toward CALL

Results indicated that there was no significant correlation between the post survey perceptions of CALL in facilitating interactions and the pre survey attitudes toward CALL. Moreover, there was no significant correlation between post survey perceptions of CALL in facilitating interactions and the post survey "beneficial" ($r_s = .172, p = .496$), "difficult" ($r_s = -.130, p = .606$), or "prefer no computer" ($r_s = -.183, p = .468$) attitudes toward CALL. On the other hand, there were significant positive correlations between the post survey perceptions of CALL in facilitating interactions and the post survey "interesting" ($r = .626, p < .01$) and "enjoyable" ($r = .500, p < .05$) attitudes toward CALL.

Furthermore, there was a significant negative correlation between the post survey perceptions of CALL in facilitating interactions and the post survey "uncomfortable" (r = -.506, $p < .05$) attitude toward CALL.

Comparison between Pre-Post Perceptions of CALL in Facilitating Interactions

Results of paired-samples t test indicated that there was no significant difference (t = -1.458, p = .163) between the pre survey perceptions of CALL in facilitating interactions (M = 3.56, SD = .271) and the post survey results (M = 4.00, SD = .181).

Descriptive Statistics and Correlations between Confounding Variables and Test Scores

The mean number of hours participants interacted with native English-speakers prior to the beginning of the training program was .19 hour per week, and the standard deviation was .57. Prior to the beginning of the training program, about 89% of the participants spent 0 hours per week interacting with native English-speaker. The mean number of hours participants watched TV and movies prior to the beginning of the training program was .06 hour per week, and the standard deviation was .24. Prior to the beginning of the training program, about 94% of the participants spent 0 hours per week watching TV and movies. The mean number of hours participants communicated with other English as Second Language (ESL) students in English prior to the beginning of the training program was .19 hour per week, and the standard deviation was .06. Prior to the beginning of the training program, about 94% of the participants spent 0 hours per week communicating with other ESL students in English.

Results indicated that there was a significant positive correlation between the pre survey variable of amount of time participants interacted with native English-speakers and the pretest grammar scores (r_s = .485, $p < .05$). Moreover, there was no significant

correlation between the pre survey amount of time participants interacted with native English-speakers and the pretest listening ($r_s = .402, p = .098$), vocabulary ($r_s = .424, p = .079$), reading ($r_s = .227, p = .365$), or total ($r_s = .429, p = .076$) scores.

There was no significant correlation between pre survey amount of time participants watched TV and movies and the pretest-posttest scores or score gains. In addition, there was no significant correlation between the pre survey amount of time participants communicated with other students in English and their pretest-posttest scores, or score gains. There was no significant correlation between participants' pre survey amount of time interacted with native English-speakers and the posttest scores. On the other hand, there were significant negative correlations between the pre survey amount of time participants interacted with native English-speakers and the listening ($r_s = -.478, p < .05$), vocabulary ($r_s = -.546, p < .05$), and total ($r_s = -.479, p < .05$) score gains.

The mean number of hours participants interacted with native English-speakers during two months of the training program was 13.17 hours per week, and the standard deviation was 11.06. A majority of the participants (67%) spent 10 hours or less per week interacting with native English-speakers. The mean number of hours participants watched TV and movies during two months of the training program was 8.33 hours per week, and the standard deviation was 4.79. About 94% of the participants spent 10 hours or less per week watching TV or movies, during two months of the training program. The mean number of hours participants communicated with other ESL students in English was 6.44 hours per week, and the standard deviation was 4.96. During two months of the training program, about 89% of the participants spent 10 hours or less per week communicating with other ESL students in English.

Results indicated that there was no significant correlation between the post survey variables of amount of time participants interacted with native English-speakers and the posttest listening (r_s = .204, p = .418), grammar (r = -.256, p = .306), vocabulary (r = -.085, p = .738), reading (r = .045, p = .560), or total (r = -.058, p = .820) scores. In addition, there was no significant correlation between the post survey variable of amount of time participants watched TV and movies and the posttest listening (r_s = .055, p = .829), grammar (r = -.100, p = .693), vocabulary (r = -.122, p = .629), reading (r = -.267, p = .284), or total (r = -.168, p = .505) scores.

Furthermore, there was no significant correlation between the post survey variable of amount of time participants communicated with other students in English and the posttest listening (r_s = -.263, p = .292), grammar (r = -.314, p = .205), vocabulary (r = -.442, p = .066), reading (r = -.133, p = .598), or total (r = -.455, p = .058) scores. Moreover, there was no significant correlation between the post survey variables (amount of time interacting with native English-speakers, amount of time watching TV and movies, and amount of time communicating with other students in English) and the score gains.

Comparison between Pre-Post Survey Confounding Variables

Results indicated that there was a significant difference (z = -3.632, p < .01) between the pre survey variable of amount of time participants interacted with native English-speakers (M = .19, SD = .572) and the post survey results (M = 13.17, SD = 11.06). There was a significant difference (z = -3.735, p < .01) between the pre survey variable of amount of time participants watched TV and movies (M = .06, SD = .236) and the post survey results (M = 8.33, SD = 4.79). Moreover, there was a significant

difference (z = -3.630, p < .01) between the pre survey variable of amount of time participants communicated with other students in English (M = .06, SD = .236) and the post survey results (M = 6.44, SD = 4.96).

Correlations between Pre-Post Survey Confounding Variables and the Demographics

Results indicated that there was no significant correlation between the pre survey confounding variables (amount of time interacting with native English-speakers, amount of time watching TV and movies, and the amount of time communicating with other students in English) and the demographics (ages, years of aviation training experience, years of experience studying English, and years of prior experience in working with computers for language learning purposes).

Results indicated that there was no significant correlation between participants' ages and the post survey confounding variables. Moreover, there was no significant correlation between participants' years of aviation training experience and the post survey confounding variables. There was no significant correlation between participants' years of experience studying English and the post survey confounding variables. On the other hand, there was a significant positive correlation between participants' prior years of experience in working with computers for the purpose of language learning and the amount of time they watched TV or movies (r = .504, p < .05).

Conclusions

The conclusions of this study are based on the findings from (a) the descriptive analyses of the variables, (b) the descriptive and inferential analyses of research questions, and (c) the follow-up analyses. The conclusions are limited to the participants in this study.

Conclusions Based on Research Question 1

Research question 1 was designed to examine the extent to which there was a difference between participants' pretest and posttest total scores on the Aviation English Placement Exam (AEPE). The AEPE was administered prior to the beginning of the blended learning aviation English training program and after two months of the intervention. To answer the question, paired-samples *t* tests were conducted. Results showed that the 19.72% increase on the posttest total scores was significant. That is, with two months of the implementation of the Computer-Assisted Language Learning (CALL) technology with an instructor (blended learning) in the Aviation English training program, participants had significant improvement on their AEPE total test scores.

To be precise, the intervention of the blended learning significantly improved participants' aviation English achievement on the AEPE, after two months of blended learning. The findings of research question 1 supported Davis and Williamson's (1998) view on implementing CALL in language learning. Davis and Williamson (1998) indicated that CALL can help language learners to develop language fluency in a matter of hours, rather than weeks, months, and years. That is, participants of the study had nearly 20% improvement on their Aviation English Placement Exam test scores after two months of blended learning aviation English training program.

Additional Pearson correlation analysis was performed. The results indicated that there was a significant positive correlation between the pretest and posttest total scores ($r = .518, p < .05$) indicating that those who scored high on one exam tended to score high on the other. On the other hand, those who scored low on one exam tended to score low on the other. The results also support Davies and Williamson's (1998) view that students

learn at different speeds; "some will bring more previous knowledge of the target language to the learning environment than others" (p.13).

Conclusions Based on Research Question 2

Research question 2 was designed to examine the extent to which there was a significant difference between the pretest and posttest scores on listening, grammar, vocabulary, and reading components of the AEPE. To answer the question, paired-samples *t* tests were conducted. Results showed that the 25.8% increase on the posttest listening scores was significant. Results also indicated that the 12.5% increase on the posttest grammar scores was significant. In addition, the 13.5% increase on the posttest vocabulary scores was significant. Finally, the 20.4% increase on the posttest reading scores was significant. The significant increases on all four components of the AEPE indicated that with two months of the intervention, participants improved their listening, grammar, vocabulary, and reading achievements in aviation English.

Results of additional correlation analyses indicated those who scored high on their pretest listening, grammar, vocabulary, or reading scores tended to score high on their pretest total scores. On the other hand, those who scored high on their pretest total scores tended to score high on their pretest listening, grammar, vocabulary, or reading scores. The results reflected that all four sections of the pretest (listening, grammar, vocabulary, and reading) contributed to the pretest total scores. Furthermore, the results of the correlation analyses supported the satisfactory reliability of the AEPE instrument (coefficient alpha .897).

In addition, participants who scored high on their pretest listening scores tended to score high on their pretest vocabulary or pretest reading scores. On the other hand,

participants who scored high on their pretest vocabulary or pretest reading scores tended to score high on their pretest listening scores. That is, participants who scored high on their pretest vocabulary scores tended to score high on their pretest grammar or pretest reading scores; those who scored high on their pretest grammar or reading scores tended to score high on their pretest vocabulary scores. On the other hand, those who scored low on their pretest vocabulary scores tended to score low on their pretest grammar or pretest reading scores; those who scored low on their pretest grammar or pretest reading scores tended to score low on their pretest vocabulary scores.

Furthermore, results of the correlation analyses on the posttest scores indicated that those who scored high on their posttest total scores tended to score high on posttest listening, grammar, vocabulary, or reading scores. On the other hand, those who scored low on their posttest listening, grammar, vocabulary, or reading scores tended to score low on the posttest total scores. In addition, similar to the pretest results, the results of the correlation analyses supported the satisfactory reliability of the AEPE instrument (coefficient alpha .875).

Participants who scored high on their posttest vocabulary scores tended to score high on their posttest reading or posttest listening scores, and those who scored high on their posttest reading or listening scores tended to score high on their posttest vocabulary scores. On the other hand, participants who scored low on their posttest vocabulary scores tended to score low on their posttest listening or reading scores, and those who scored low on their posttest listening or reading scores tended to score low on their posttest vocabulary scores. That is, participants' performances on the listening section did not necessarily reflect their performances on the grammar or reading sections of the

AEPE, after two of the blended learning training. Moreover, after two months of the blended learning aviation English training program, participants' performances on the grammar section did not reflect their performances on the vocabulary or reading sections of the AEPE.

Moreover, results of the correlation analyses between pretest-posttest scores indicated that participants who scored high on their pretest reading scores tended to score high on their posttest total scores or posttest reading scores, and those who scored high on their posttest total scores or posttest reading scores tended to score high on their pretest reading scores. On the other hand, those who scored low on their pretest reading scores tended to score low on their posttest total scores or posttest reading scores, and those who scored low on their posttest total scores or posttest reading scores tended to score low on their pretest reading scores. That is, participants who scored high on their pretest vocabulary scores tended to score high on their posttest vocabulary scores, and those who scored high on their posttest vocabulary scores tended to score high on their pretest vocabulary scores. On the other hand, participants who scored low on their pretest vocabulary scores tended to score low on their posttest vocabulary scores, and those who scored low on their posttest vocabulary scores tended to score low on their pretest vocabulary scores.

To be precise, participants' performances on their pretest listening, grammar, or vocabulary scores did not reflect their performances on the posttest total scores. Conversely, participants' performances on their posttest total scores did not reflect their performances on the pretest listening, grammar, or vocabulary scores. In addition, participants' performances on their posttest listening scores did not necessarily reflect

their pretest listening, pretest grammar, pretest vocabulary, or pretest reading scores. On the contrary, participants' performances on their pretest listening, grammar, vocabulary, or reading scores did not reflect the posttest listening scores. Participants' performances on their posttest grammar scores did not mirror their pretest grammar, vocabulary, or reading scores.

Conclusions Based on Research Question 3

Research question 3 was designed to examine participants' attitudes toward learning English with Computer-Assisted Language Learning technology, before and after two months of the blended learning aviation English training program. Results of the paired-samples *t* tests and Wilcoxon matched-pairs signed-ranks tests indicated participants' attitudes toward using CALL in learning English before and after the training program did not differ significantly. Furthermore, results indicated that participants generally had positive attitudes toward learning English with CALL, both before and after two months of the blended learning aviation English training program.

The results of the attitudes toward learning English with CALL supported Aacken's (1999) case study. That is, similar to Aacken's (1999) study, participants of this study generally had positive attitudes toward CALL. Before and after two months of blended learning, majority of participants reported that learning English with CALL was "beneficial", "interesting" and "enjoyable". In addition, in Aackecn's (1999) study, a student who had negative attitudes toward CALL had a low performance on the test scores. However, Aacken (1999) did not attempt to run the correlation analyses between students' attitudes toward CALL and their test scores. Therefore, additional correlation

analyses were utilized in this study to examine if correlation existed between participants' attitude toward CALL and their pretest-posttest scores.

Results of additional correlation analyses indicated that prior to the beginning of the training program participants' attitude of "beneficial" did not statistically reflect on their test scores. Moreover, after two months of the blended learning aviation English training program, the results of the correlation analyses indicated that participants who reported that learning English with CALL was beneficial tended to score high on their posttest listening, vocabulary, or total scores. Participants who scored high on their posttest listening, vocabulary, or total scores tended to report that learning English with CALL was beneficial. On the other hand, participants who reported that learning English with CALL was not beneficial tended to score low on their posttest listening, vocabulary, or total scores; and those who reported that learning English with CALL was not beneficial tended to score low on their posttest listening, vocabulary, or total scores.

Moreover, prior to the beginning of the training program, participants' pre survey attitude of "interesting" did not reflect on their pretest-posttest scores. In addition, after two months of the blended learning training program, participants who reported that learning English with CALL was interesting tended to score high on their posttest reading scores, and those who scored high on their posttest reading scores tended to report that learning English with CALL was interesting. On the other hand, after two months of blended learning, participants who reported that learning English with CALL was not interesting tended to score low on their posttest reading scores, and those who scored low on their posttest reading scores tended to report that CALL was not interesting.

Prior to the beginning of the training program, participants' attitude of "enjoyable" did not reflect on their pretest-posttest scores. In addition, after two months of the blended learning, participants' responses to the post survey attitude of "enjoyable" did not statistically reflect on their posttest scores. Results showed that prior to the beginning of the training program, participants' attitude of "difficult" did not statistically reflect on their pretest-posttest scores. Moreover, participants' responses to the post survey attitude of "difficult" did not statistically reflect on their posttest scores.

The study found that prior to the beginning of the training program, participants' attitude of "uncomfortable" did not statistically reflect on their pretest-posttest scores. In addition, after two months the blended learning aviation English training program, participants' responses to the attitude of "uncomfortable" did not reflect on their posttest scores either. The study also found that prior to the beginning of the training program, participants' attitude of "prefer no computer" did not reflect on their pretest-posttest scores. Moreover, participants' responses to the post survey attitude of "prefer no computer" did not reflect on their posttest scores either.

The findings of the study indicated that there were positive correlations between participants' post survey attitudes (beneficial and interesting) and posttest total scores or sections of posttest scores. That is, participants who had positive attitudes toward CALL tended to score high on their posttest scores, which corroborated Aacken's (1999) findings in his study. Furthermore, the study also found that participants who had fewer prior years studying English or working with computers were more likely to feel that learning English with CALL was difficult, and those who had more years studying

English or working with computers were more likely to feel that using CALL in learning English was not difficult.

The findings supported the view of Bueno et al. (1999) on language learners' experiences with CALL and language skills. Bueno et al. (1999) indicated that students who had experience with CALL software tend to have enhanced navigational skills and language skills. Moreover, the findings also corroborated Grace's (2000) view on second language learners' proficiency levels and language learning. Grace (2000) suggested that "as learners develop their lexicon and knowledge of the structure of the L2, they can make correct inferences more easily" (p.221).

Conclusions Based on Research Question 4

Research question 4 was designed to examine participants' perceptions of CALL in facilitating interactions in the classroom, before and after two months of the blended learning training program. Paired-samples *t* test indicated participants' perceptions of CALL in facilitating interactions before and after the training program did not differ significantly. Results indicated that participants generally had positive perceptions of Computer-Assisted Language Learning technology in facilitating interactions in the classroom, before and after two months of the blended learning aviation English training program.

Moreover, the study also found that prior to the training program, participants who had more years of prior experience studying English tended to indicate that CALL facilitated interactions. The finding of the relationship might be that the more years participants had of prior experience studying English, the greater their opportunities would be of encountering CALL in learning English, which further affected their

expectations of CALL in facilitating interactions. In addition, the study found that participants who had positive perceptions of CALL in facilitating interactions prior to the beginning of the training program tended to score high on their pretest scores. Moreover, participants who had positive perceptions of CALL in facilitating interactions tended to score high on their posttest reading scores.

The relationship might be that students who reported that CALL facilitated interactions prior to the beginning of the training program were more willing to use CALL's reading practice function as a medium for interactions. Furthermore, after two months of training program, participants who had positive perceptions of CALL in facilitating interactions tended to score high on the posttest total scores.

Furthermore, participants who had positive perceptions of CALL in facilitating interactions tended to have positive attitudes toward CALL. On the other hand, participants who had negative perceptions of CALL in facilitating interactions tended to have negative attitudes toward CALL. The findings of the pre survey suggested that participants who indicated that CALL facilitated interactions in the classroom prior to the beginning of the training program tended to score high on their pretest listening, pretest total, and posttest reading scores. The findings of the post survey also indicated that participants who reported that CALL facilitated interactions after two months of blended learning tended to score high on their posttest total scores.

The findings of correlations of pre-post survey perceptions of CALL in facilitating interactions might be that participants who had positive perceptions of CALL in facilitating interactions tended to have positive attitudes toward CALL, which further affected their pretest and posttest scores on AEPE. The findings support the views of

scholars such as Mydlarski (1998), Cushion and Hémard (2000), and Bull (1997) on the advantages of peer learning or cooperative learning in language learning. The findings indicated that participants who had positive perceptions of CALL in facilitating interactions tended to score high on the test scores. As Bull (1997) indicated, having students working together with the system to clarify their knowledge and beliefs and cooperation is one of the social strategies within learners' language learning. Moreover, the findings also corroborated Kohn's (1992) argument that cooperation is more productive than competition, and it is enjoyable.

Conclusions Based on Research Question 5

Research question 5 was designed to examine the extent to which participants' demographics, motivation, and their perceptions of CALL in facilitating interactions were related to their attitudes toward learning English with CALL. The study found that participants' prior years of experience studying English ($r_s = -.704, p < .01$) and prior experience in working with computers for language learning purposes ($r_s = -.564, p < .05$) negatively correlated to the post survey "difficult" attitude toward CALL. Participants who had fewer years of prior experience studying English or working with computers for language learning purposes tended to indicate that learning English with CALL was difficult.

The study found that participants' perceptions of CALL in facilitating interactions significantly correlated to their attitudes toward learning English with CALL. Participants who had positive perceptions of CALL in facilitating interactions tended to have positive attitudes toward using CALL in learning English. On the other hand, participants who had negative perceptions of CALL in facilitating interactions tended to have negative

attitudes toward using CALL in learning English. Furthermore, the study found that participants who reported that learning English with CALL was difficult prior to the beginning of the training program tended to report that their motivations for learning English was "to gain respect from others" after two months of training program.

The study found that the positive correlation between pre survey "difficult" attitude toward CALL and the post survey motivation of "gain respect from others" is difficult to interpret because the pre survey "difficult" attitude was prior to the beginning of the training program and the post survey motivation of "gain respect from others" was after two months of the training program.

In Aacken's (1999) study, there was a significant correlation between the motivation of "travel" and the attitude of "difficult" toward using CALL in language learning. Aacken (1999) also found that the negative correlation was difficult to interpret. The findings of the post survey supported Aacken's (1999) findings. Aacken (1999) found that students who preferred not to use computer tended to prefer to interact with people, because computers cannot replace the human interaction.

Moreover, the study found that the pre survey instrumental (course requirement and become a better educated person) and intrinsic (like language learning) motivations positively correlated to the pre survey "enjoyable" attitude toward using CALL in learning English. That is, participants who were instrumentally or intrinsically motivated tended to feel that using CALL in learning English was enjoyable, prior to the beginning of the training program. In addition, the post survey instrumental (definite future career in aviation) and integrative (interact with English-speaking North Americans while living in the United States) motivations negatively correlated to the post survey attitude of "prefer

no computer" toward CALL. Participants who were integrative or instrumentally motivated tended to indicate that they preferred not to use computers in leaning English.

Moreover, the students who considered that CALL was beneficial tended to have the language motivation of "definite career" (Aacken, 1999). The study found negative correlation between the post survey attitude of "prefer no computer" toward learning English with CALL and the attitude of "a definite future career in aviation" which mirrored Aacken's (1999) findings. That is, students who preferred not to use computer in learning English tended not to study English for a definite future career in aviation, and those who did not prefer to study English with no computer tended to study the language for the purpose of a definite future career in aviation.

The findings supported Aacken's (1999) findings. Aacken (1999) found that the more participants preferred not to use a computer, the more they desired to interact with native English speakers. In addition, the participants who indicated that CALL was beneficial were more likely to study English for the instrumental motivations of definite future career and to become a better educated person. Moreover, the finding of the intrinsic motivation of "like language learning" of this study emulate Ramage's (as cited in Noels et al., 2003) findings in his study. Ramage found that continuing students were more intrinsically motivated; that is, they were more motivated to learn language for language's sake. Moreover, the discontinuing students were more extrinsically motivated. That is, discontinuing students had stronger interest in language learning as a mean to other goals.

Moreover, the findings of the pre- and post survey of the study also supported the argument that instrumental motivation may be a central component of second language

learning (Dörnyei, 1994, & Aacken, 1999). As Aacken (1999) indicates in the study, the findings of his study cannot be generalized because of the small number of participants. In conclusion, the findings of this study generally supported the findings of scholars such as, Aacken (1999), Noels et al. (2003), Dörnyei (1994), and Ramage's (as cited in Noels et al., 2003) findings in the field of motivations in language learning.

Conclusions Based on Research Question 6

Research question 6 was designed to examine the extent to which participants' demographics, motivation, their perceptions of CALL in facilitating interactions, their attitudes toward learning English with CALL, and the confounding variables related to the score gains. Even though the post survey correlation analyses showed positive correlations between positive attitudes toward CALL and score gains, and negative correlations between post survey attitude of "difficult" and score gains, results of correlation analyses between pre survey variables and score gains suggested that the five problems of measurement of change might have occurred. There are five problems of interpretation of the raw gain scores: *ceiling effect, regression toward the mean, assumption of equal intervals, different types of ability, and low reliability* (Gall et al, 1996). Therefore, the conclusions of research question 6 will be based on the pretest-posttest scores.

The study found that participants' prior experience in aviation training and their ages had positive effects on their pretest-posttest reading scores. The relationships might suggest that participants who were older might have more years of prior experience in aviation training, which further suggested that they might have more opportunities encountering the technical aviation English reading materials that further reflected on

their reading scores. The findings supported Davies and Williamson's (1998) views. Davies and Williamson's (1998) suggested that students learn at different speeds, where "some will bring more previous knowledge of the target language to the learning environment than others" (p.13).

In addition, the study found that there was no significant correlation between participants' prior years of experience studying English and their pretest-posttest scores. The findings might be suggesting that participants' prior experience studying English might not be in the technical aviation English. In China, students are required to study English in 3 years of junior high school, 3 years of senior high school, and 4 years of college. Therefore, the majority of the participants reported that they had an average of 10 years experience studying English, in which the English requirement courses were not designed specifically for the aviation English. Consequently, their years of prior experience studying English did not correlate to their pretest-posttest scores on the Aviation English Placement Exam.

Moreover, the study found that there was no significant correlation between participants' prior years of experience in working with computers for language learning purposes and their pretest-posttest scores. Bueno et al. (1999) found that students who have experience with the CALL software tend to have enhanced navigational skills and language skills. However, in this study, participants' prior years of experience in working with computers for language learning purposes did not reflect on their pretest-posttest scores.

Furthermore, similar to Ramage's (as cited in Noels, et al., 2003) finding that continuing students were more intrinsically motivated, this study also found that the pre

survey intrinsic motivation of "like language learning" were positively correlated to the pretest listening scores ($r = .581, p < .05$). In Matsukawa and Zhong's study also found that "Japanese students' interest in English was related to increased intrinsic motivation, more determination to achieve better English scores, and a greater likelihood of achieving high scores" (as cited in Noels et al., 2003, p. 75). Furthermore, participants who were not instrumentally motivated tended to score high on their test scores. That is, continuing students were more intrinsically motivated in second language learning.

Akin to Aacken's (1999) findings, the study found that participants who had positive attitudes toward using CALL in learning English tended to score high on their test scores. The findings of the study also corroborate the views of Noels et al. (2003) that positive attitudes toward the learning situation are consistently associated with second language learning achievement. In addition, the study found that participants who had positive perceptions of CALL in facilitating interactions tended to score high on their pretest-posttest scores. The findings support views of scholars such as, Mydlarski (1998), Cushion and Hémard (2000), and Bull (1997) on the advantages of peer learning or cooperative learning in language learning. Moreover, the findings also support Kohn's (1992) argument that cooperation is more productive than competition, and it is enjoyable. Furthermore, as expected, the results of the correlation analyses showed that no confounding variable had significant correlation with participants' posttest scores on the AEPE.

The current study also found that participants' prior years of experience studying English positively correlated to the pre survey perceptions of CALL in facilitating interactions ($r = .600, p < .01$). The finding might be that participants who had more

years of experience studying English were more confident in learning English, which further encouraged their confidence in discussing learning activities with other students during CALL sessions. Moreover, the study also found a positive correlation between participants' prior years of experience in working with computers for the purpose of language learning and the amount of time they watched TV and movies ($r = .504, p < .05$). This finding might be that participants who had more years of experience in working with computers for language learning purposes were more confident in learning language via various types of multimedia.

Limitations of the Study

The results of the study cannot be generalized to all foreign flight trainees as only a group of Chinese adult male flight students were employed in this study. In addition, small number of participants is a limitation of the study. Therefore, the conclusions of the findings are limited to the participants in this study. In spite of the limitations, the findings of the study have implications for future implementation of blended learning in ESP training programs.

Implications

Even though the study found that the participants in the study had about 20% improvement on their total posttest scores, there was only a 12.5% increase on the grammar scores and a 13.5% increase on the vocabulary scores. The findings indicated that improvements or changes might be needed in the particular training program's grammar and vocabulary training. More training activities focusing on grammar and vocabulary components of aviation English might be needed in the particular CALL training system. In addition, the instructor of the particular blended learning aviation

English training program could also implement more of grammar and vocabulary instruction in the classroom based on the findings of the study. Cushion and Hémard's (2000) study indicates that students of language learning would like computers to provide a greater interactive combination of grammatical structures and individual practice (p.109).

Furthermore, the findings of the study indicated that participants' perceptions of CALL in facilitating interactions positively correlated to their posttest total scores. Mydlarski (1998) indicates that language learners can participate in a variety of cooperative CALL activities, such as, collaborative writing and computer-mediated communication (p.128). However, to achieve this, academic tasks and social situations need to be structured by the teachers to increase the quality and the richness of language learning (Mydlarski, 1998).The instructor of the particular training program and the system developers of the particular CALL system could perhaps consider incorporating more of the premises of peer learning or cooperation models in the blended learning training program. The instructor should encourage interactions among trainees during the CALL sessions and the system developers of the CALL system should incorporate more training activities that would promote interactions between trainees.

Recommendations for Future Research

This study identified factors that facilitate blended learning in ESP: attitudes toward CALL, motivations, perceptions of Computer Assisted Language Learning (CALL) in facilitating interactions, English learning experience, and computer experience. Additional research is needed that would investigate the implementation of

Computer-Assisted Language Learning with an instructor (blended learning) in English for Specific Purposes. Specifically, the questions remaining are:

- What role does gender play in blended language learning?
- What is the precise role of motivation in blended learning of English for different purposes?
- What factors affect language learners' attitudes toward using CALL in learning English, especially English for Specific Purposes?
- What roles do different cultural backgrounds play in blended learning ESP training?
- For non-adults, can such intervention also be as effective through short-term training as the current study?
- Will language learners who receive either traditional classroom or only CALL English for Specific Purposes (ESP) instructions and have the same levels of achievement over the same period of training as those who received blended instruction?
- Will the length of the blended learning training program affect language learners' achievement on the test scores?
- How effective is the transfer of training gained in the blended learning training program?

Future Research

Future research should focus on the investigation of different genders' motivations and learning strategies in blended language learning. Ehrman and Oxford's (1989) study on effect of sex differences on adult language learning found that women used more language learning strategies than men did. Moreover, Ehrman and Oxford

(1989) also found that career choice was an influence on strategy use in language learning. Future studies should also investigate whether different cultural backgrounds affect language learners' achievement in blended learning ESP training. Aacken's (1999) study on language learners with different cultural backgrounds in learning Japanese showed that different students with different cultural backgrounds might use different learning strategies in language learning.

If conditions permit, future research might investigate whether there is a difference regarding language learners' achievement between the intervention and non-intervention groups. Furthermore, future study can also focus on the factors in students' language study experiences and their perceptions of CALL in facilitating interactions in the classroom. In addition, future study should also investigate whether there is a link between language learners' computer experiences and their perceptions of learning language via variety of multimedia. Moreover, future research should investigate the effectiveness of the transfer of training of blended learning. Finally, more research is needed to determine whether extrinsic or intrinsic motivations play a more important role in blended ESP learning.

Summary

The general purpose of this study was to examine the effectiveness of the implementation of online learning Computer-Assisted Language Learning (CALL) systems blended with an instructor (blended learning) in the English for Specific Purposes (ESP) training program. The study found that within two months of the implementation of the blended learning in the Aviation English training program, the participants had significant (19.72%) improvement on their total test scores. To be

precise, there was a 25.8% increase on the posttest listening scores, a 12.5% increase on the posttest grammar scores, a 13.5% increase on the posttest vocabulary scores, and a 20.4% increase on the posttest reading scores.

Participants in the study generally had positive attitudes toward learning English with CALL, before and after two months of the blended learning aviation English training program. In addition, participants generally had positive perceptions of Computer-Assisted Language Learning technology in facilitating interactions in the classroom, before and after two months of the blended learning aviation English training program. The study found that participants who had fewer years of experience studying English or fewer years of experience in working with computers for language learning purposes tended to feel that learning English with CALL was difficult.

The study also found that participants who had positive perceptions of CALL in facilitating interactions in the classroom tended to have positive attitudes toward using CALL in learning English. On the other hand, participants who had negative perceptions of CALL in facilitating interactions in the classroom tended to have negative attitudes toward using CALL in learning English. The study found that participants who had the instrumental motivations (course requirement and to become a better educated person) and the intrinsic motivation (like language learning) tended to feel that using CALL in learning English was enjoyable, prior to the beginning of the training program.

In addition, participants who had the instrumental motivation (definite future career in aviation) and the integrative motivation (interacting with English-speaking North Americans while living in the United States) tended to feel that they preferred not to use computers in leaning English. Furthermore, the results of correlation analyses

between pre survey variables and score gains suggested that the five problems of the measurement of change might have occurred. The five problems of the measurement of change are: *ceiling effect, regression toward the mean, assumption of equal intervals, different types of ability, and low reliability* (Gall et al, 1996). Therefore, the conclusions of the research question 6 were based on the pretest-posttest scores. Research question 6 was designed to examine the extent to which participants' demographics, motivation, their perceptions of CALL in facilitating interactions, their attitudes toward learning English with CALL, and the confounding variables related to the score gains.

The study found that participants who were older might have more years of prior experience in aviation training, which further suggested that they might have had more opportunities encountering the technical aviation English reading materials. The study found that participants who had positive attitudes toward using CALL in learning English tended to score high on their test scores. In addition, participants who had positive perceptions of CALL in facilitating interactions in the classroom tended to score high on their pretest-posttest scores. Furthermore, the study found that participants who had more years of experience studying English might be more confident in learning English, which might further encourage their confidence in discussing learning activities with other students during CALL sessions. Moreover, the study also found that participants who had more prior years of experience in working with computers for language learning purposes might be more confident in learning language via various types of multimedia.

In conclusion, this study finds that implementing the Computer-Assisted Language Learning blended with an instructor in the Aviation English training program produces satisfying results among the participants of the study. Moreover, the findings of

the study generally supported scholars' findings in the fields of language learning and Computer-Assisted Language Learning. Language learners' motivations, attitudes toward using CALL in learning language, their perception of CALL in facilitating interactions, their prior experience in language learning, and their experience in working with computers for language learning purposes could be important factors in determining their achievements in learning language via blended learning instruction. Finally, the findings of the investigation promote further research and development for new CALL technology to be implemented in either ESP or other training programs to reach a balancing act between theory and practice (Cushion & Hémard, 2000).

APPENDIX A

Permission to Use the AEPE Instrument

Virtual Languages

CONFIDENTIALITY AGREEMENT

THIS CONFIDENTIALITY AGREEMENT (this "Agreement"), is made and effective as of this _____ day of _____, 2003 by and between Virtual Languages, Inc., a Florida corporation ("VL") with an address at 1700 North Dixie Highway, Suite 114, Boca Raton, Florida, 33432 (the "Company"); and _____, with an address at Chien-Yu, Chiu ("Interested Party").
Lynn UNH. Student (Dr. Serrano)

W I T N E S S E T H:

WHEREAS, the Company and Interested Party are each mutually desirous of exploring the possibility of entering into a business relationship; and

WHEREAS, in the course of pursuing such business relationship, Interested Party may be given access to or may become acquainted with certain Confidential Information (as that term is hereinafter defined) regarding the Company; and

WHEREAS, Interested Party and the Company each desire to reflect their agreement as to such Confidential Information by executing and delivering this Agreement.

NOW, THEREFORE, in consideration of the mutual premises and covenants herein contained, and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereto hereby agree as follows:

1. **Confidentiality** Re: Virtual Languages Austrian English Placement Exam & related Materials.

A. Confidential Information and Materials. Interested Party hereby acknowledges that as a consequence of Interested Party and the Company exploring a business relationship, the Company may disclose or make known to Interested Party, and Interested Party may be given access to or may become acquainted with certain information, materials and trade secrets, including, but not limited to, information regarding methods of operation, methods of installation, methods of distribution, formulations, finances, contracts, customer lists, potential customers, business plans, supplier lists, pricing, marketing, patents, patent applications, trademarks, trademark applications, copyrights, copyright applications, products, skills, performance specifications, price lists, engineering, technical and other data, research, strategies, designs, drawings, samples, trade secrets, and other information and know-how all relating to or useful in the Company's business, and which the Company regards as confidential and in the nature of trade secrets (collectively "Confidential Information"). Notwithstanding anything to the contrary contained herein, the term Confidential Information, as used herein, shall not include that which: (a) is known to Interested Party at the time of disclosure

1thereof; (b) is or becomes publicly available without the breach of this Agreement by Interested Party; and/or (c) is subsequently disclosed to Interested Party by a third party who is in lawful possession of the Confidential Information and is not under an obligation of confidence.

B. Nondisclosure Covenant. In recognition by Interested Party that such Confidential Information constitutes valuable and unique assets owned by, or in the custody of, the Company, Interested Party hereby covenants and agrees that for the five-year period of time commencing as of the date hereof, Interested Party shall not use the Confidential Information or any part thereof in any manner for Interested Party's own account or for the account of a third party, and that Interested Party shall hold all of such Confidential Information in the strictest confidence, not to be used, reproduced, distributed or disclosed to anyone, directly or indirectly, either by writing or orally or otherwise, without the express written consent of the Company. Interested Party further agrees to use its best efforts to protect the confidentiality of such Confidential Information, including, without limitation, conveying and/or disclosing such Confidential Information only to those persons associated with Interested Party who have a need to know such Confidential Information. Notwithstanding anything contained herein to the contrary, nothing herein shall preclude Interested Party from doing business with any person or entity engaged in any business which might be deemed directly or indirectly in competition with the Company; it being acknowledged by the parties hereto that the purpose of this Agreement is to protect the Company's Confidential Information, but not to restrict the business of Interested Party in so doing, provided such Confidential Information is not so used by Interested Party in its business operations.

C. Ownership of Confidential Information. All documents relating to the Confidential Information, as well as the Confidential Information itself, are the exclusive property of the Company.

D. Return of Confidential Information. Promptly upon the Company's request, all writings, tapes, samples, designs, manuals, or other physical manifestations of the Confidential Information, all writings and material describing, analyzing or containing any Confidential Information, and all copies thereof, which relate in any manner to or which Interested Party obtained directly or indirectly from the Company shall be delivered by Interested Party to the Company.

2. **Miscellaneous**. This Agreement shall be governed by the laws of the State of Florida. This Agreement contains the entire understanding and agreement of the parties with respect to this subject matter set forth herein, superseding any and all prior agreements, written and oral, between the parties regarding the same subject matter. Each party agrees that no other agreement, covenant, representation, inducement, promise or statement with respect to the subject matter hereof, if not set forth herein in writing, shall be valid or binding. Any waiver, alteration or modification of

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any of the provisions of this Agreement, or cancellation or replacement of the same, shall not be valid unless made in writing and signed by the parties hereto. In connection with any action arising from or in connection with the enforcement of this Agreement except as specifically provided herein, the prevailing party shall be entitled to an award of its expenses, including reasonable attorney and paralegal fees and disbursements incurred or paid before and at trial or any other proceeding which may be instituted, at any tribunal level, and whether or not suit or any other proceeding is instituted. In the event there is a breach or threatened breach by Interested Party of the provisions of Section 1, the Company shall be entitled to a temporary and permanent injunction without bond to restrain Interested Party from engaging in the activities prohibited in Section 1 above, and the Company will be entitled to reimbursement for all costs and expenses, including reasonable attorneys' fees, in connection therewith.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first above written.

_____

By: [redacted]
Name: Christopher Chin
Title: _____

VIRTUAL LANGUAGES, INC.

By: [redacted]
Name: Jean Giles Ordonez
Title: President

MIA-300860-1

APPENDIX B

Permission to Conduct the Study at the Participating Institution

PAN AM
INTERNATIONAL FLIGHT ACADEMY

March 1, 2004

Dear Charles,

Please accept this letter as your official invitation to participate in the English training program at Pan Am International Flight Academy, located in Ft. Pierce, FL.

After speaking with you, it is my understanding that you will be conducting a survey at the beginning of the English training for our Chinese students and then will do another survey at the completion of the student's training. I also understand you are doing this study as part of the requirement to complete your degree and obtain your doctorate.

Please let me know when you are available to participate in our class and you will be more than welcome. I wish you the very best as you successfully complete your training.

If you need additional information, you may reach me at [redacted]

Looking forward to meeting you in person soon.

Sincerely,

[redacted]

Denise Nugent
Center Director

APPENDIX C

IRB Approval Letter

LYNN UNIVERSITY
BOCA RATON, FLORIDA

April 8, 2004

Chine – Yu Chiu
[redacted]

Re: IRB Review 2004-010

Dear Mr. Yu Chiu:

Thank you for submitting the documentations of certified translations of the consent form and the questionnaires in Chinese; and the permission letter from Pan Am International Flight Academy. The Institutional Review Board has given final approval of your proposal.

Best of luck in conducting your research!

Sincerely,

[redacted]
Farideh Farazmand, Ph.D.
Institutional Review Board, Chair

Cc: Dissertation Chair, Dr. Serrano

3601 North Military Trail, Boca Raton, Florida 33431-5598
(561) 237-7000 www.lynn.edu

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